MAY 1953
90th Year

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

• **FRESH AIR INTAKES** provide for adequate combustion. **Page 56**

• **YOU CAN** take the guesswork out of cooling load calculations. **Page 60**

CENSUS OF HOUSING reveals sales potentials for local areas. **Page 80**

INSTALLED EQUIPMENT can be repossessed — sometimes. **Page 113**

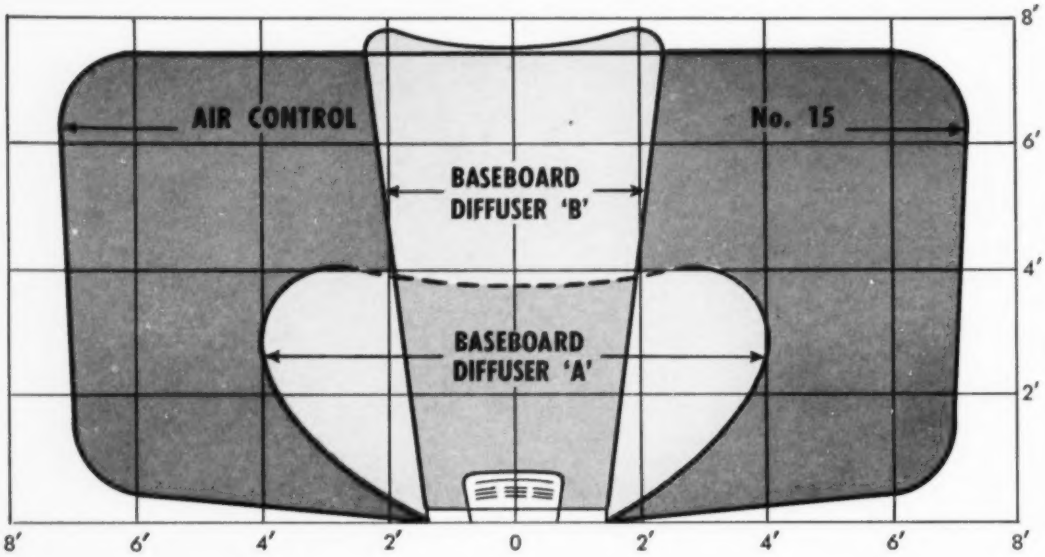
Cover Picture

FORT WORTH DEALERS tell *air* conditioning story to home owners. **Page 72**

Complete Contents of this Issue ..... **Page 4**

COMPARE COSTS • COMPARE PERFORMANCE!

You'll choose AIR CONTROL'S #15 DIFFUSER!



AIR CONTROL No. 15
Diffuser blankets 112 sq. ft. of wall area. Only one diffuser and one run to completely cover the average wall.

BASEBOARD DIFFUSER 'A'
Covers only 32 sq. ft. Requires more than one run for the average wall.

BASEBOARD DIFFUSER 'B'
Gives only 24 sq. ft. strip-coverage, practically no spread!

AIR CONTROL No. 15 DOES THE JOB BETTER BY EVERY STANDARD

FOR HEATING • FOR COOLING

THE IDEAL SIDEWALL PERIMETER DIFFUSER

Air Control's exclusive flared face design completely blankets the wall and diffuses the air without drafts — while presenting the lowest possible resistance factor. It is truly the best method of air diffusion for both heating and cooling and is by far the most economical.

SAVE—$30 TO $40 ON EVERY JOB

BASEBOARD DIFFUSER 'A' — Costs $5.70 ea. (Average installation $57.00)
BASEBOARD DIFFUSER 'B' — Costs $4.75 ea. (Average installation $47.50)
AIR CONTROL NO. 15 — Costs Only $1.95 ea. (Average installation $19.50)

IT'S GOOD BUSINESS TO SPECIFY AIR CONTROL EVERY TIME

CHART 1

B.T.U.H. AT REGISTER*

Register Temperature	AIR VOLUME (c.f.m.)				
	40	60	80	100	120
120 degree	1980	2970	3960	4950	5940
150 degree	3010	4510	6010	7520	9020
180 degree	4080	6120	8160	10,200	12,250

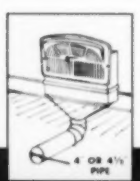
*Based on Return Air Temp. of 70 degrees.

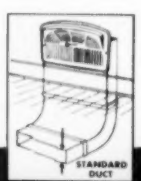
CHART 2

TECHNICAL DATA — No. 15 DIFFUSER

Face Velocity (F.P.M.)	Volume (C.F.M.)	Pressure Loss (in W.G.)	Spread (Ft.)	Throw (Ft.)
200	53	.005	10.5	5.5
250	66	.008	11	6
300	79	.010	11.5	6.5
350	92	.016	11.5	6.5
400	106	.020	12	7
450	119	.026	12.5	7
500	132	.030	13	7.5
550	145	.037	13.5	7.5
600	158	.042	14	8

ONE UNIT FITS EVERY JOB.



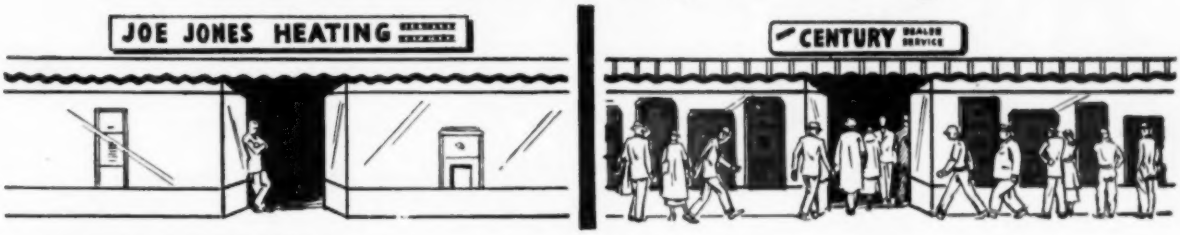


for complete information, write

AIR CONTROL PRODUCTS, Inc.

DEPT. A COOPERSVILLE, MICHIGAN

where would you buy?

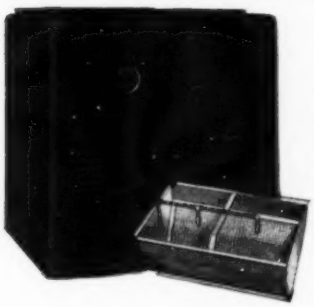


CENTURY'S complete gas and oil line brings 'em in - sells 'em - keeps 'em sold

People want to choose from a complete line they know and trust. There's a CENTURY automatic heating unit for every size and style home, and folks everywhere know that CENTURY stands for quality!

Choose the 40-model gas and oil line that **closes more** sales, **makes more** sales, creates **more satisfied** customers — CENTURY! It will be well worth your time to learn more. Clip coupon below and get the details.

Lined up for more sales -- highlights from CENTURY'S complete new line



NEW Automatic Humidity Control available on CENTURY Loboys

EXCLUSIVE new CENTURY AIR WASHER-HUMIDIFIER for automatic and exact "living room control" of humidity. Fits most manufacturers' basement models. Available on the newly engineered CENTURY Loboys. (6 models gas — 8 models oil).

New Century Hiboys

Now—restyled and redesigned for efficient service-free heat at a competitive price. Bottom, side or rear air intake. (4 models gas—4 models oil.)

APPROVED FOR ZERO CLEARANCE

NEW Century Counterflows

Permits installation **flush** at sides and rear, giving zero clearance! May even be installed on combustible floors! Approved by A. G. A. and Underwriter's Laboratories Inc. Another Century first. (4 models gas—4 models oil.)

To round out the line: Boiler-Burner Units (oil, 3 models) and gas and oil Conversion Burners. Also Industrial type Hiboy units.

Century

CENTURY ENGINEERING CORP.
Cedar Rapids, Iowa

. . . manufacturers of fine automatic heating equipment for 27 years.

Nationally advertised in leading home magazines.

CENTURY ENGINEERING CORP.
416 Third St. **Cedar Rapids, Iowa**

Please send me further details on items checked below.

- ☐ Gas Lo-boys
- ☐ Gas Hi-boys
- ☐ Gas Counterflow
- ☐ Gas Conversion Burners
- ☐ Hot Water Boilers
- ☐ Oil Lo-boys
- ☐ Oil Hi-boys
- ☐ Oil Counterflow
- ☐ Oil Conversion Burners
- ☐ Controllable Air Washer-Humidifier

Name_____

Company _____

Address _____

City _____ State _____

AMERICAN ARTISAN

MAY 1953

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Founded 1864

Volume 90 No. 5

RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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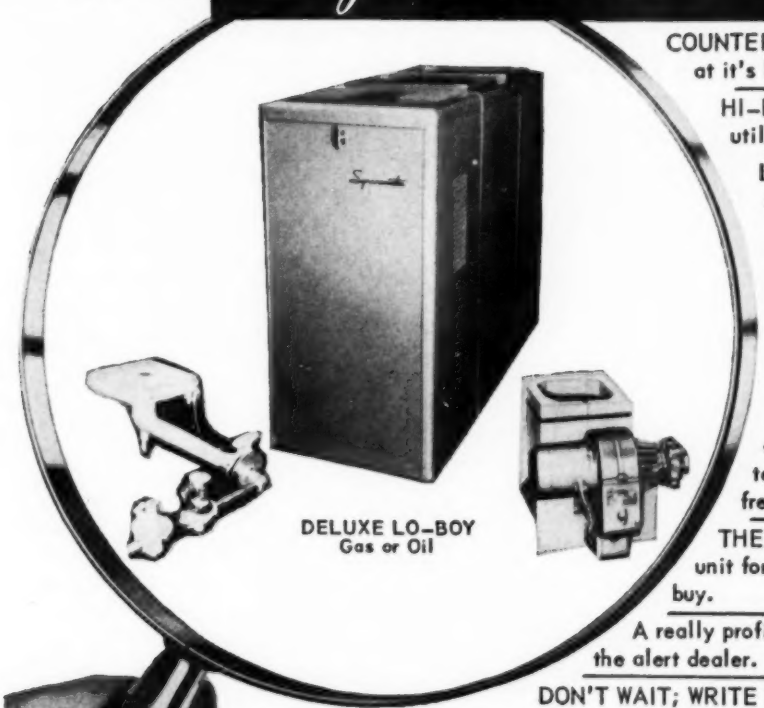
ENLARGE YOUR SALES WITH THE VERSATILE NEW "500" SERIES FURNACES

BY Syncromatic FOR



DELUXE LO-BOY
Gas or Oil

COUNTERFLOW – perimeter heating at it's best.

HI-BOY – for conventional or utility room use.

LO-BOY – for basement – conventional – perimeter or baseboard installation.

ALL models are quickly convertible from Oil to Gas or Gas to Oil.

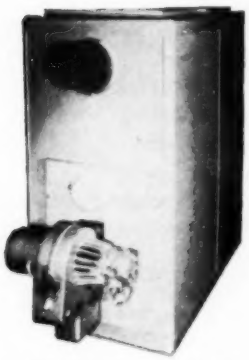
SYNCROMATIC'S traditional heavy guage construction and high operating efficiencies are your guarantee for long life and trouble free operation.

THE most efficiently designed unit for Gas or Oil that you can buy.

A really profitable line of furnaces for the alert dealer.

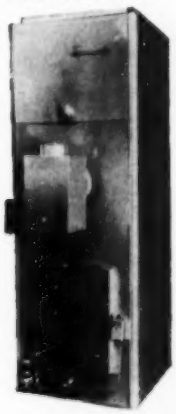
DON'T WAIT; WRITE FOR DETAILS TODAY!

OIL
85,000 B.T.U. at bonnet
All GASES
100,000 B.T.U. input



STANDARD LO-BOY
Gas or Oil

HI-BOY
Gas or Oil



COUNTERFLOW
Gas or Oil

Syncromatic Corporation

WATERTOWN WISCONSIN

Manufacturers of fine heating equipment for nearly a quarter century. 5-5-3

the editor's notebook

NWAHACA Committee to Meet, June 11

THE PUBLICITY and merchandising committee of the National Warm Air Heating and Air Conditioning Association will meet on Thursday, June 11, at the Edgewater Beach hotel. The meeting will start at 9:30 a.m.

New Homes Include $1000 Air Conditioning

PRINCIPAL SALES feature in a 96-home building program under construction in Oak Park, Mich., according to a release from Chrysler Airtemp Div., Chrysler Corp., is year 'round air conditioning costing approximately $1000. The new homes offer 2 or 3 hp air conditioners as optional equipment, depending on the size of the home where they are installed. Houses are priced from $15,900 to $18,500.

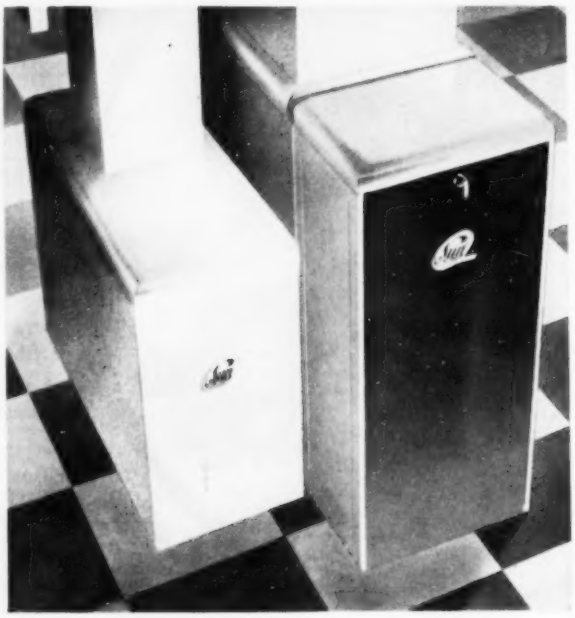
In Politics, "Where There's No Smoke . . ."

THE NEWLY ELECTED mayor of St. Louis is Raymond R. Tucker, professor of mechanical engineering on leave from Washington University. Prof. Tucker was smoke commissioner of St. Louis some years ago.

Iron Ore Shipments Reported

FROM VENEZUELA, Cuba and Liberia, the iron and steel companies in the United States received increased shipments of iron ore last year, according to American Iron and Steel Institute. However, total foreign ore imports decreased to about 10,900,000 net tons, compared with about 11,300,000 tons in the preceding year. Production and shipments of domestic iron ore declined about 21 million net tons to about 109 million tons, a decrease of 16 per cent, according to the Bureau of Mines. This decline was accounted for by the work stoppage affecting the domestic iron and steel industry.

grows two
WHERE *ONE* GREW BEFORE



The SUN franchise gives the heating contractor *two* profitable home air conditioning items instead of one — SUN Series 5000 Oil- or Gas-Fired Furnaces and SUN Compressor Cooling Unit. It *doubles* his sales and *doubles* his profits. He sells *twice* the usual order without extra selling expense and gives the utmost in customer satisfaction.

Get details today about the SUN heating-cooling franchise.

J. V. Patten Company
SYCAMORE, ILLINOIS, U.S.A.
ESTAB. 1895 • INC. 1928

(continued)

Air Conditioning Articles Continue Popular

Cleveland, Tenn.
WE LOOK FORWARD to each new copy of American Artisan every month. Glad you are concentrating on air conditioning.
R. H. HAWK SONS
Warm Air Heating Dealer

Washington, D. C.
I WOULD appreciate it very much if you would send me six copies of the article *Residential Cooling Equipment Available This Year* which appeared in the March issue.
JOHN G. WEBSTER & SONS, INC.
Warm Air Heating Dealer

Wilkes-Barre, Pa.
I READ in your March issue a summary of air conditioning fundamentals. Since air conditioning is becoming an important part of our business, I would appreciate it if it were possible to have articles 1 to 6.
LUZERNE & LACKAWANNA SUPPLY CO.
Wholesalers

Cleveland, Ohio
I HAVE JUST finished reading the March issue of American Artisan. Your survey of complete packaged central

OWNING a LOCKFORMER makes DOLLARS.... and SENSE!

FIGURE IT OUT.....

with a LOCKFORMER in your shop, you'll be rolling Pittsburgh Locks and other seams about fifteen times as fast as you could with a hand brake. Think of what this fabrication speed means in terms of stepping-up production schedules, meeting customer demand and improving all-around efficiency. And with a LOCKFORMER you can figure on being on a par with even the biggest of your competitors . . . because the *most* they can have are LOCKFORMERS too.

FIGURE IT UP.....

the increased production that a LOCKFORMER delivers means better business and bigger profits for you. Figure on doing more work, handling bigger jobs . . . expediting every job for faster delivery and prompter payment. Add in the tangible factor of delivering a smooth, professionally finished job every time. *Any way you figure it, you're money ahead with a LOCKFORMER!*

Write today for the new LOCKFORMER Catalog.

ONE MAN WITH A LOCKFORMER MAKES MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

residential cooling units is excellent.
HUPP CORP.
Manufacturers

West Lafayette, Ind.
I LIKED YOUR March issue especially well, perhaps because more articles than usual were of particular interest to me. The news of residential cooling equipment was timely and attractively presented. Your present series on Air Conditioning Fundamentals is quite comprehensive.
FREDERICK B. MORSE
Professional Engineer

Jacksonville, Fla.
PLEASE FORWARD copies of the September, October, November, December 1952 and January 1953 issues of American Artisan. We forwarded our check on March 17 for a three year subscription.
FRED A. RANKIN CO.
Warm Air Heating Dealer

Requests Reprints of 430 Stainless Article

Buffalo, N. Y.
THE ARTICLE *How to Fabricate Type 430 Stainless* is excellent, and I would appreciate it very much if you would send me eight reprints of it.
RIGIDIZED METALS CORP.
EUGENE P. THOMAS
Chief Engineer

Record Nickel Production in 1952

THE HIGHEST ore production in history was achieved during 1952, according to a report from The International Nickel Co. About 166,000 tons of nickel in all forms were delivered from all sources last year to meet the needs of the "free world." The company supplied 75 per cent of this amount, the report states, and increased its

52%
INCREASE
IN THE NUMBER OF
WHOLESALERS
SELLING
Nu-Way
OIL BURNERS
And when you know the reasons, you will understand why it pays to sell Nu-Way. First of all, there's a complete line of Nu-Way Oil Burners for both domestic and commercial installations with oil burning capacities from .5 G.P.H. to 20 G.P.H. Nu-Way is noted for quality oil burners . . . over 30 years experience in manufacturing oil heating equipment plus exclusive patented features.
In addition, dealers are helped in the sale of Nu-Way Oil Burners with national ads, hard-hitting newspaper ad mats, direct mail pieces, booklets and catalogs.
MR. DEALER:
See your supplier today for complete information, or write . . .
OIL HEATING EQUIPMENT
THE NU-WAY CORPORATION
ROCK ISLAND, ILLINOIS
Sold through Jobbers and Distributors
Also Special Applications for Furnace or Boiler Manufacturers
"Automatic Oil Heat Exclusively Since 1921"

rolling facilities by more than 15 per cent to keep up with demand. This increase in production is intended to help speed the day when more nickel will be available for civilian use.

Predicts Boom in Cooling Sales

W. B. COTT, sales manager, Air Conditioning Div., Westinghouse Electric Corp., predicts that air conditioning sales this year will far surpass the record peaks the industry set in 1952, regardless of whether or not 1953 is a hot year. Mr. Cott based his conclusions on observations and interviews during a recently conducted coast-to-coast application engineering school for air conditioning distributors. "All signs point to air conditioning rapidly becoming a year 'round business with the peak season problem leveling out for both manufacturer and distributor", he said. "From our observations, Americans are fast becoming geared to the desirability and need for air cleaning and conditioning units. It is a safe prediction that in five years a house or office without such equipment will not be considered up-to-date."

Receives Record Orders for Cooling Units

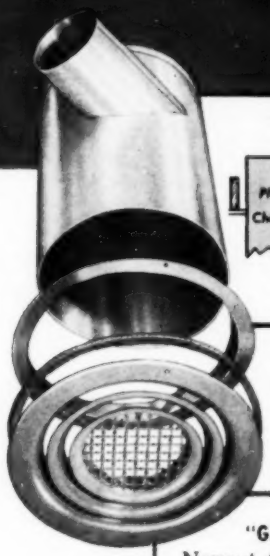
AIRTEMP DIV., Chrysler Corp., is scheduling its 1953 production of air conditioning units to be 50 per cent greater than the 1952 output.

J. F. Knoff, vice president and general sales manager, said that the unprecedented number of orders for all types of air conditioning made it necessary for the company to double its planned 25 per cent increase. "Shipments of packaged air conditioning units, not including room air

The Right Register—

FOR EACH OF YOUR SMALL PIPE INSTALLATIONS

BY Char-Gale



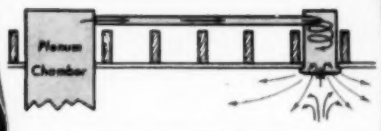


Diagram of typical Char-Gale "Gale-Aire" Ceiling Diffuser Installation.

A circular outward thrust imparted to the air entering the register box, produces a partial vacuum in the center of the cylinder. Room air is drawn up into the box and blended with the heated air to provide a gentle, effective warming action.

Proper registers are essential to the proper operation of small pipe systems. Char-Gale's complete selection makes it easy for you to choose exactly the right register for every situation.

"GALE-AIRE" CEILING DIFFUSER

Newest Char-Gale register, the "Gale-Aire" Ceiling Diffuser is designed to provide effective air tempering and distribution. The unit includes a cylindrical box, fitting ring, foam rubber gasket, and register.

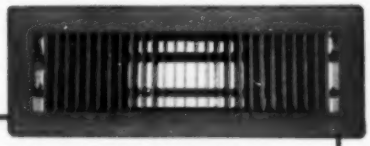
"GALE-AIRE" SIDEWALL REGISTER

The "Gale-Aire" Sidewall Register distributes air evenly in all directions along the wall. Adjustable, it permits complete balancing at the registers. Complete with register, box and a foam rubber gasket.

"GALE-AIRE" BASEBOARD REGISTER

Including all the features of the Sidewall Register, the "Gale-Aire" Angle Baseboard Register is designed especially for older homes. It is installed through a floor opening, with no wall cuts needed.

MEMBER INDOOR COMFORT



"GALE-AIRE" FLOOR DIFFUSER

Answers the need for an inexpensive method of distributing air along outside walls. Vanes set at proper angles to achieve a fan-shaped diffusion pattern.

Remember:

Char-Gale provides everything from plenum to register in the "Gale-Aire" System. Also a complete line of registers and fittings for your conventional installations.

Contact your jobber or write us direct

CHAR-GALE MANUFACTURING COMPANY

MINNEAPOLIS-MINNESOTA

the editor's notebook

(continued)

conditioners", Mr. Knoff said, "rose 92 per cent over the number shipped in the first quarter of 1952. Shipments of room air conditioners rose 300 per cent over the number shipped in the first quarter of 1952."

See Trend To Complete Home Conditioning

"ONE OF THE MOST significant developments throughout the country last year was the increased use of home air conditioning equipment, both small room units and complete systems," it is noted in the 1952 annual report of the Minneapolis-Honeywell Regulator Co. "The sharp increase in sales of individual room units is an indication of the demand for home air conditioning. It represents, we believe, an intermediate step that will accelerate the trend toward the broad use of complete home air conditioning systems," the report says. "This fast growing trend represents additional sales potentials, of course, to suppliers of equipment used in complete home air conditioning systems."

Suggests Builders Plan for Future Cooling

WHEN BUYING or building a new home, two design factors should be considered if the buyer eventually plans to install air conditioning, according to C. E. Buchholzer, president, Chrysler Airtemp Div., Chrysler Corp. "While the home is still in the construction stage", he said, "it is easy and inexpensive to install adequate ductwork to handle both cool and warm air. Also, specifications should include a furnace blower with sufficient capacity to distribute cool air throughout the home. Then, when the owner decides to buy a central type air conditioner, the installer only has to connect the unit to existing warm air ducts, and make the necessary water and electrical connections. This saves time and labor on the part of the installer, and money for the home owner."

HERE THEY ARE...SENTRY'S TWO NEWEST ADDITIONS TO THEIR EVER-POPULAR

AT-A-GLANCE (DIRECT AND REMOTE) TANK GAUGES

THERMA-GAUGE

A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, *accurate measure* gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a *double coated* cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

QUICKLY, SIMPLY INSTALLED. Illus. at left shows how entire calibration and float assembly may be inserted and positioned *after* two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.

SENTR-ECON

Write for complete details — literature

A new, durable, low cost instrument for economy installations.

Exceptionally high quality for such a competitively priced gauge. Features patented *double dome* with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. *Double coated* cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1½" openings only. Factory calibrated and adjusted to insure accuracy.

KRUEGER *Sentry* GAUGES

GREEN BAY • WISCONSIN

the editor's notebook

(continued)

Building Boom Follows Removal of Controls

A REVIVED commercial building boom is definitely under way following the removal of controls on materials, according to the Chamber of Commerce of the United States.

Construction Expenditures Above Last Year's

JANUARY expenditures of more than $2.3 billion for new construction were at record high levels, according to the Bureau of Labor Statistics. Although 8 per cent below December, they were 6 per cent above the January, 1952, level. The high level of activity during January, 1953, largely reflected substantial increases from January, 1952, in private residential building, plus moderate gains in private commercial building and in major types of public construction.

Business Failures Rise in January

RISING 11 PER CENT in January to 647, business failures reached the highest level in seven months, according to a recent issue of *Dun's Review*. Despite this upturn, casualties were 4 per cent lighter than in the comparable month a year ago. In fact, failures for this January were the lowest for any January in four years; they com-

Steak was really "rare" in the 90's

At the turn of the century the "butcher's wagon" was a familiar sight. For many rural families it was their only meat market.

Electric refrigeration has revolutionized food marketing, but equally important are the benefits to public health. Now, you can keep your steaks in the "pink of condition" for one day or fifty-two weeks, as you choose.

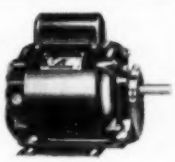
The volume production of dependable and efficient Emerson-Electric Hermetic Motors has been a contributing factor in making modern refrigerators and food freezers economically sound investments for millions of Americans.

Leading makers of motorized products for the farm, home, business and industry depend on Emerson-Electric's 62 years of motor building experience. For information on this complete line of standard motors in ratings from 1/20 to 5 h.p., and hermetic motors from 1/8 to 20 h.p., write:

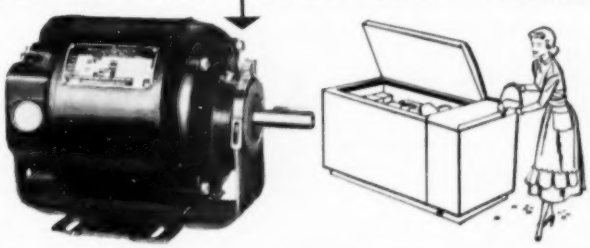
THE EMERSON ELECTRIC MFG CO., St. Louis 21, Missouri

MODERN LIVING IS POWERED WITH ELECTRIC MOTORS

EMERSON-ELECTRIC MOTORS
For Belted Fans and Blowers



These motors incorporate all the electrical and mechanical specifications best suited for this service. Split-phase motors, available in 1/6, 1/4 and 1/3 h.p., with resilient mountings and automatic reset thermal protectors. For complete data write for Motor Bulletin No. 408.



EMERSON ELECTRIC
MOTORS • FANS APPLIANCES

LEADERS IN THE MOTOR AND FAN INDUSTRY SINCE 1890

the editor's notebook

(continued)

pared with a post-war peak of 864 in the first month of 1950 and a pre-war toll of 1237 in 1940.

The January rise in failures occurred primarily in retail and wholesale trade. More retailers failed than in any month since June 1952. The number of manufacturing failures remained about even with that in the preceding month.

Fan and Unit Heater Shipments Reported

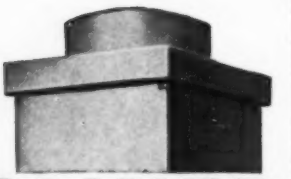
SHIPMENTS of fans, blowers, and related equipment in the fourth quarter of 1952 were valued at $32.0 million, a decrease of 11 per cent from the value of shipments reported for the third quarter, according to the Bureau of the Census, Department of Commerce. This drop was accounted for chiefly by shipments of propeller fans, which declined from $12.3 million in the third quarter to $7.4 million in the fourth quarter.

Shipments of unit heaters and related equipment in the fourth quarter amounted to $15.6 million, an increase of 20 per cent over shipments of $13.0 million in the third quarter of 1952. The value of orders booked during the fourth quarter was $16.5 million, up 14 per cent over the $14.5 million reported for the third quarter.

Predict Ample Steel to Supply Demand

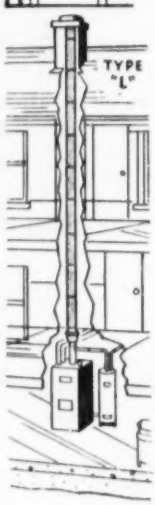
EDWARD L. RYERSON, chairman, and Clarence B. Randall, president, Inland Steel Co., said in a letter to stockholders that they thought the demand for steel would fall below available supply later this year. "Our facilities are well maintained and constantly being improved and expanded", they said. "Our raw material reserves are of good quality and ample in supply for the distant future."

"the Pioneer prefabricated Chimney"



VITROLINER

for ALL FUELS



• SAVE TIME
• SAVE MONEY
• SAVE SPACE

Vitroliner is a complete prefabricated and packaged chimney for one or two story buildings using all fuels.

• SPEEDS UP CONSTRUCTION TIME by eliminating all masonry work. Being light weight (10-15 lbs. per ft.) it installs easily and quickly in one man hour.

Vitroliner is tailor made — pre-cut at the factory to fit the individual building — no cutting or fitting at the time of installation.

• THE INITIAL COST is low — much less than the cost of a comparable masonry chimney. When you consider the savings on installation labor the complete cost is the lowest of any pre-fab chimney.

• SAVES SPACE in all type homes and buildings. Mounts between ceiling joists in homes (without basement) or in floor (with basement) directly over the heating plant. In two story buildings the flue can be boxed in a corner of any room or closet.

Available in any quantity 1 or a thousand — in 6", 7", 8" and 10" Diameters.

Investigate this fast selling, well designed chimney today. Write for complete literature.

CONDENSATION
ENGINEERING CORPORATION
3511 W. POTOMAC AVE., CHICAGO 51, ILL.

the editor's notebook

(continued)

Stoker Sales in 1952

FACTORY SALES of mechanical stokers in 1952 totalled 23,000 units, according to the Bureau of the Census, Department of Commerce. This is a decrease of 4 per cent from the 24,000 units reported for 1951. Sales of residential and other small stokers amounted to 18,801 units, or 82 per cent of the total, while sales of larger stokers, totalling 4246 units, accounted for the remainder.

Discuss New York Building Code

THE STATE Building Code Commission, New York, held a series of public conferences during April and the first part of May in various cities to discuss: 1) the commission's overall program of building code improvement, with special reference to local code problems, and 2) a proposed multiple dwelling code. More than 500 local organizations, including professional societies, building trades councils, chambers of commerce, real estate boards, building contractors associations, and similar groups had been invited to set up building code committees to review the proposed multiple dwelling code, which will be promulgated later this year, and to present their conclusions at the conferences.

Approximately 12,000 municipal officers and others interested in the state's building code program received invitations to attend.

TIPS ON SELLING FURNACES—REMEMBER...

A MAN IS THE WORLD'S WORST SKEPTIC

Whatever his name, he's a doubting Thomas. He frowns at any assurance you give him unless it's in print. But show him in writing how the product is backed and his smile is as big as his order.

There'll be no doubt in his mind when you show him a Rheem Furnace. First, because you can show him how every Rheem is Fire-Tested at the factory, works perfectly before it gets to him. Second, you can show him the Rheem warranty, a full warranty that says what it means and means what it says.

There'll be no doubt what this twin Rheem assurance will mean to you. As it has to so many dealers like you, it means more sales, bigger profits. It means that there is no line to match the Rheem Furnace line—for your customers or for you.

RHEEM MANUFACTURING CO.
4361 Firestone Boulevard, South Gate, Calif.
Please send order forms for furnace promotion material.
Name_____
Address_____
City_____ State_____

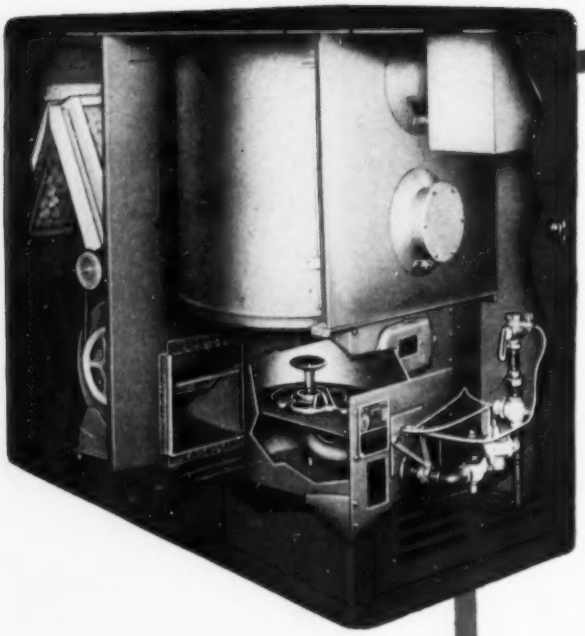
RHEEM MANUFACTURING COMPANY

Guaranteed by Good Housekeeping

World's Fastest Growing Manufacturers of Warm-Air Heating Equipment

©1953 RHEEM MFG. CO.

A "Good Living" ... WITH Waterbury



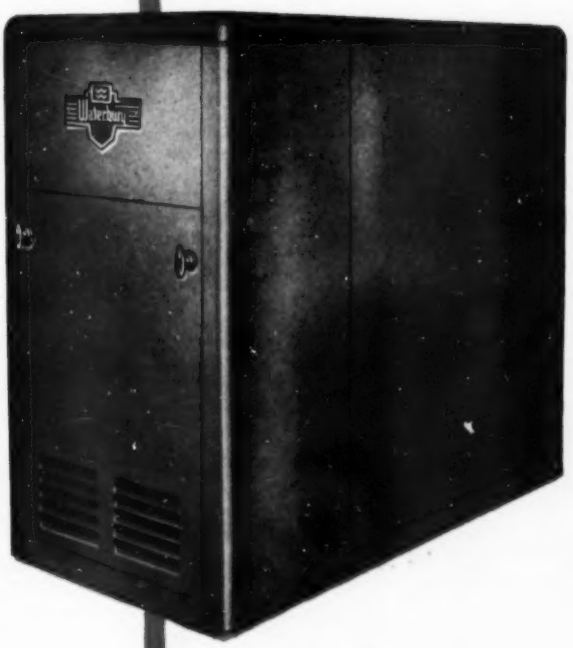
Waterbury Dealers find that association with Waterman-Waterbury is good business. With Waterbury units fired by coal, oil or gas, and in sizes to fit every home, they are able to handle any warm air installation. This gives Waterbury Dealers a wide selection of prospects . . . prospects already sold on Waterbury quality through national advertising and the testimony of their friends. These factors combine to build a strong business and provide a good living.

"It's what's under the casing that counts!"

Waterbury

FURNACES, WINTER AIR CONDITIONERS, GAS CONVERSION BURNERS

A "Good Life" . . .



More than a good living is involved in a Waterbury Dealership. There is the satisfaction of selling a quality product and matching that product with a quality installation. There is the joy of friendship with satisfied customers. There is the security of a sound dealer-distributor-factory relationship. And there is the knowledge that every Waterbury Dealer can plan on continued Waterbury development. Yes, a Waterbury Dealer can expect a "good life" with Waterbury.

Waterbury

The Waterman-Waterbury Co.

OVER 40 YEARS OF WARM AIR HEATING

1122 Jackson Street, N. E. • Minneapolis 13, Minnesota

DEPENDABLE PERFORMANCE EASY INSTALLATIONS . . . . . .

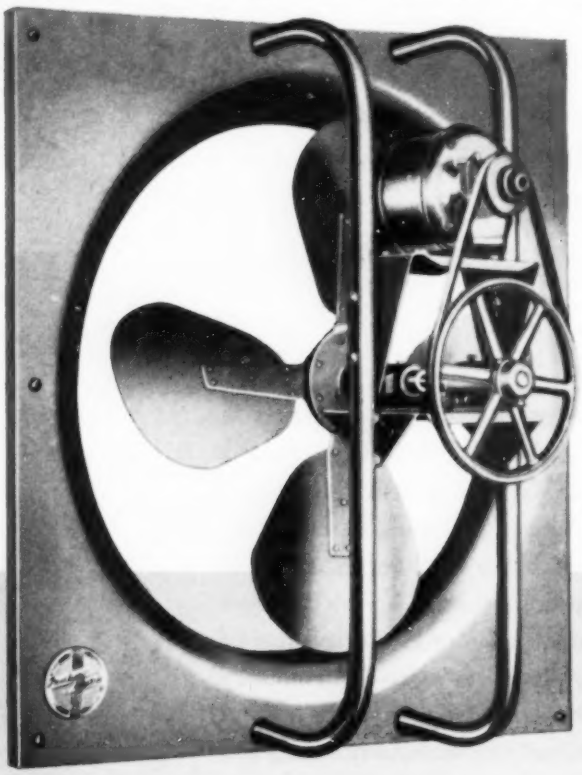
Peerless-built heavy duty motor selected for quiet, efficient and continuous service. Protected by automatic thermal overload circuit breaker.

Variable pitch motor pulley prevents slippage, provides quick, easy method for adjustments.

Wool-packed rubber-mounted sleeve bearings prevent leakage, reduce maintenance requirements.

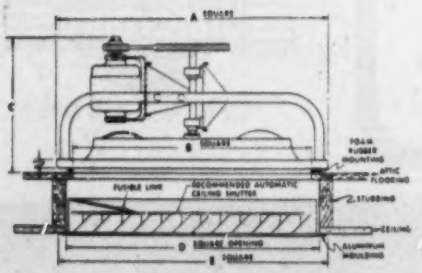
Completely designed for easy installation — needs only four lag screws for permanent vibration-free performance.

Perfectly balanced heavy gauge steel blades at slow, quiet speeds to assure rated capacity at low noise level.



TYPE PAT VENTILATTIC FAN

Day or night, Ventilattic PAT runs smoothly, efficiently and quietly to provide maximum air circulation at a minimum cost of less than three cents per day. Panel, arms and bearing support assembly are completely welded together—you can depend that Peerless units will not develop into rattletraps. To prevent any inefficient back pressures, the deep venturi in the panel corrals all air pockets and drives them along with other exhaust air.



TYPE HAT VENTILATTIC FAN

Correct answer to modern design problems where installations require an exhaust fan in the low attic spaces prevalent in ranch type homes. Installation is quick, easy and economical. Day-time heat can be exhausted rapidly to reduce temperatures 15° to 25°. Type HAT is equipped with an automatic ceiling shutter to provide required inlet air velocities. Shutter attachment includes fusible link for fire underwriters' requirements. Aluminum-trim strips give face of shutter an enhancing appearance that complements any ceiling. Mounting can be either horizontal or vertical.

Smoothest Performers on the Market!!

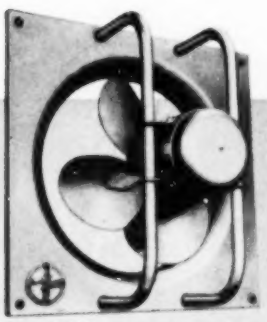
Smooths way to Summer Profits

WITH Peerless Electric FANS AND BLOWERS

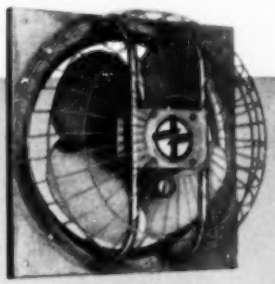
● Profits are bigger when you can save time in installation and when the performance is so dependable that, once installed, you don't have to worry about expensive call backs. Each unit represents the highest degree of quality materials and precision workmanship that 59 years of experience can provide.

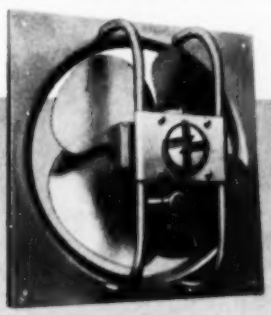
Peerless Fan and Blower units are compactly designed, completely assembled and ready to install. Each unit is equipped with a job-matched Peerless motor . . . fan or blower and motor operate as an integral balanced unit for maximum economy. Exclusive with all Peerless Electric units is the MOLLY-FLOW drive—a method which double checks against fan and blower vibration. Standing behind each air-moving unit you install is an unconditional guarantee against faulty workmanship.

With Peerless you get prompt delivery and quick service. Write today for a complete list of prices and specifications or contact your local distributor for assistance with any planning or installation problems you may have.



PVS Exhaust Fan is furnished complete with 1, 2 or 3-speed controller starting switch, and can be mounted either vertically or horizontally: 4 or 6 lag screws or bolts only are required to provide a permanent, quiet and trouble-free mounting. Opening may be round or square to allow greater adaptability in installation.

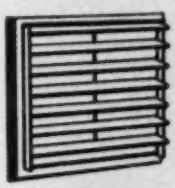




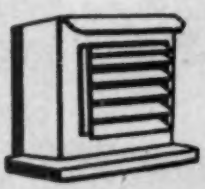
With or without inlet guards, the PVS-1 and PVS-2 long-hour duty fans are suitably used for exhaust ventilation in kitchens, laundries, bakeries, taverns, retail stores, factories and many other places. Three-speed controls vary volume of air flow from one-half to full capacity.

A COMPLETE LINE . . .

Peerless-built certified fan and blower units meet every requirement of economy, efficiency and safety. Write today for your free catalog showing the complete line of fans, blowers, louvers, shutters, penthouses, blower-filter package units and all accessories. For dependable performance and fast, friendly service . . . you can always count on Peerless.



SHUTTERS



PENTHOUSES

BLOWERS

THE PEERLESS ELECTRIC COMPANY

FAN AND BLOWER DIVISION

Peerless Electric

1405 W. MARKET ST., WARREN, O.

Everybody wants summer comfort...

This Combination provides year 'round air conditioning
You can sell the Mayfair for installation with any of the quality built winter air conditioners in the American-Standard line. It is shown here alongside the gas fired Seneca. Using the same ductwork, it takes up minimum space, can be installed easily and quickly.

NOW...an electronic air cleaner that really filters out dust, pollen and bacteria—

The MAGNE-FILTER Air Cleaner

In the Magne-filter—the first dry type electronic air filter on the market—you have a product with almost unlimited sales possibilities. Every home with a winter or summer air conditioner is a prospect.

Made in seven sizes to meet all residential air cleaning requirements, the Magne-filter can be easily, quickly and inexpensively installed in the return air duct of any forced warm air heating or cooling system. And because this amazing new product is a dry type filter, no water connection is required.

biggest selling opportunity in years!

RESIDENTIAL COOLING

by AMERICAN-Standard

The market for residential cooling units is tremendous. Every home with a forced warm air heating system is a prospect. You are face to face with the biggest selling opportunity in years. And with the Mayfair summer air conditioner, the sensational new self-contained unit by American-Standard, you can offer your customers the simplest, most economical cooling system available.

The MAYFAIR *Summer Air Conditioner* by AMERICAN-Standard

■ Designed for modern homes, the Mayfair summer air conditioner is a residential cooling unit in an attractively styled Forge Red jacket that harmonizes with virtually any surroundings.

Featuring hermetically sealed refrigerant circuits—tested and sealed at the factory—it is as dependable and simple in operation as a modern refrigerator. Thermostatic control automatically assures comfort cooling in hot weather. Mechanically cooled and dehumidified air circulates through the entire house.

The Mayfair summer air conditioner can be installed in new construction or modernization jobs with amazing speed and ease. It takes up minimum space and uses the same ductwork as the conventional forced warm air heating system.

Stock and display *NOW* for pre-season selling

Now is the time to add cooling to your line. Every new warm air heating job you install is a prospect for the Mayfair summer air conditioner . . . and the homes you have sold in the past are just waiting for a cooling unit like the Mayfair. So, get in touch with your wholesale distributor without delay. Order a stock of Mayfair units now! (It is easily stocked.) Set up a display in your store . . . and go after your share of the profitable cooling business in your town.

American Radiator & Standard Sanitary Corporation,
P. O. Box 1226, Pittsburgh 30, Pa.

These features make the Mayfair a highly efficient, economical summer air conditioner

HERMETICALLY SEALED REFRIGERANT CIRCUITS — One-horsepower refrigerant circuits—two circuits in model HC-200, three in model HC-300 — are completely sealed at the factory. They are as dependable in operation as a modern refrigerator. Covered by a 5-year warranty.

MORE EFFICIENT REFRIGERANT — The use of Freon-22 contributes to the lower operating cost of the Mayfair.

STEP-STARTING RELAY — Intermediate relay starts one compressor at a time to reduce starting current.

STEP OPERATION—The use of separate refrigerant circuits permits flexible capacity control. This exclusive control system permits cutting out circuits automatically when less cooling is desired.

EASY INSTALLATION—The Mayfair is a compact unit, shipped ready for simple connection to existing ductwork, and water and electrical services.

QUIET OPERATION—Built-in compressor mufflers, cushion mounting of all moving parts, and internal canvas connections assure quiet operation.

SIMPLIFIED SERVICE—A refrigeration service man is not required; hermetically sealed circuits are easily and quickly replaced.

AMERICAN-Standard
COOLING

Serving home and industry

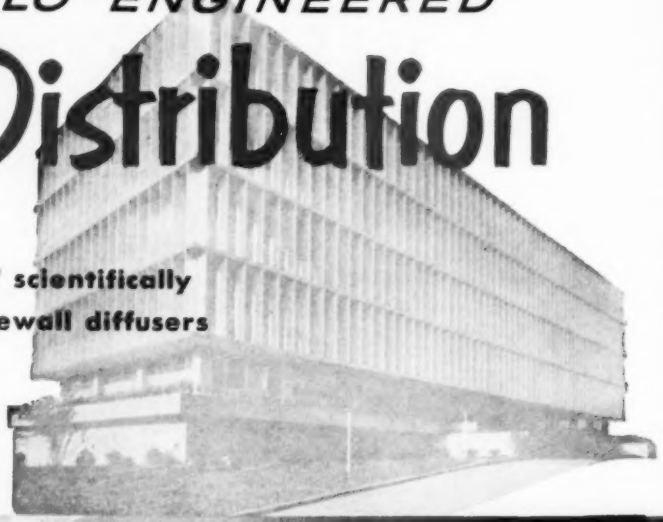
AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS

BARBER COLMAN

"UNI-FLO" ENGINEERED

Air Distribution

New Pan-American building "breathes" scientifically through Barber-Colman ceiling and sidewall diffusers



Architects: Skidmore, Owings and Merrill. Associate architect: Claude E. Hooton. Consulting engineers: Cary B. Gamble & Associates. General contractor: George T. Glover Co. Mechanical contractor: Emile M. Bast Co. Sheet metal contractor: Sidney N. Prats.

***"Uni-flo" square ceiling diffusers** are used throughout the building, some between light troffers, others replacing acoustical ceiling sections. Due to Barber-Colman's unique deflection control disc on supply units, adjustments from vertical to horizontal discharge are made easily without change in appearance.*

***Recessed** units are inconspicuous, harmonize architecturally.*

Air distribution, skilfully engineered to meet climate and occupancy requirements, is a noteworthy feature of the new Pan-American Life Insurance Co. building in New Orleans.

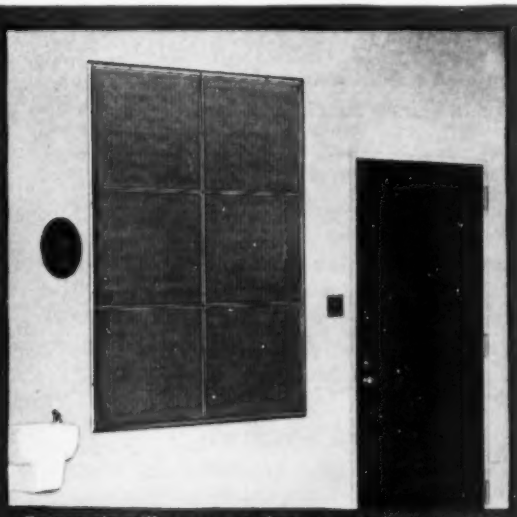
Some of the 604 "Uni-flo" square ceiling diffusers are used for return air. The remainder of these diffusers are used to supply air uniformly, quietly, efficiently. Each of the latter is equipped with an exclusive deflection control disc which permits utmost flexibility in establishing air patterns from horizontal to vertical, after installation. Uncomfortable drafts, corner smudges are eliminated.

Counteracting solar heat through the vast glass expanses, and permitting occupants individual control over air supply to offices, is the function of 524 knob-operated, sidewall type "Uni-flo" diffusers in the window stools. Sponge rubber gasketed to prevent leaks, with a removable core for cleaning purposes, these double deflection diffusers are of attractive design, rugged in construction, and engineered for maximum adjustment within a safe range.

An additional 90 "Uni-flo" side wall diffusers were specified for auditorium, print shop, paper storage, and engine room areas. Some 20 door grilles for air return completed the project.

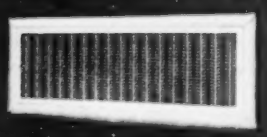
For data on Barber-Colman's complete line of expertly engineered grilles, registers and diffusers, phone your nearby field office, or send coupon below.

Knob-operated "Uni-flo" sidewall diffusers in window stools permit individual control of air supply.



Return air grille in rear of company auditorium, one of 110 sidewall and door grilles installed in life insurance building.

"Uni-flo" Sight-Tite grilles in doors assure privacy.



"Uni-flo" double deflection sidewall diffuser has removable core.

BARBER COLMAN

"UNI-FLO" ENGINEERED

Air Distribution

Air Distribution Products • OVERdoors & Operators • Automatic Controls
Aircraft Controls • Industrial Instruments • Small Motors • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

BARBER-COLMAN COMPANY, ROCKFORD, ILL., U. S. A.
Dept. F, 1106 Rock St. • Field offices in principal cities

☐ Please send new data bulletin on engineered air distribution equipment, F. 4471-1

Name_____

Firm Name_____

Address_____

City_____ State_____

Glazing the Air-Conditioned Home

WHY AIR CONDITIONING CALLS FOR SPECIAL CONSIDERATION OF WINDOWS

Windows are possible sources of heat gain in summer, just as they may waste heat in winter. That's why, in air-conditioned homes more than ever, windows must be thoughtfully planned to give home buyers the comfort they want, and to assure efficient and economical operation of the air-conditioning system.

YOU HAVE THESE CHOICES FOR BETTER HEATING AND COOLING:

1. Resort to old-style, small windows to reduce heat loss and heat gain.
2. Use insulated windows. There are two ways to do this:
   a. Storm sash on all windows the year 'round.
   b. Sealed insulating glass in all windows.

SMALLER WINDOWS

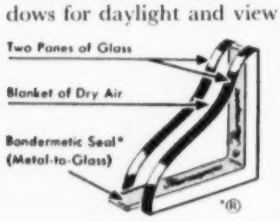
Smaller windows have steadily lost favor with architects, builders and buyers. Home buyers have shown a tremendous and continued desire for picture windows and window walls. To give them smaller windows would be a backward step that is sure to run into sales resistance—resistance which would be felt by builders, architects, real estate people and air-conditioning people, too.

INSULATED WINDOWS

Insulated windows, the other possibility, are a more logical and saleable answer to glazing for air-conditioning and heating economy. With insulated windows you reduce heat loss in winter and heat gain in summer. They save fuel in winter and power in summer, and help make the house more comfortable the year 'round. Consider the two ways of insulating windows:

1. Storm sash is one means of window insulation. They can be left in all year to provide summer as well as winter insulation. But they must be taken down periodically for washing, since dirt and moisture will infiltrate between them. And storm sash in sizes required for today's larger windows are unwieldy.

2. Sealed double glazing allows the use of large windows for daylight and view without the bother of storm sash. More and more builders have been putting *Thermopane*® insulating glass in medium and low-price homes just for its winter benefits. Now, in the air-conditioned home, these become year-round benefits and the extra cost of double glazing is doubly justified. The extra cost is minimized by the use of standard size units, standard sash and simplified installation methods.



Architect Everett V. Welch, Dallas, Texas, used *Thermopane* insulating glass in this air-conditioned home in Dallas. Says Mr. Welch: "This resulted in savings on both heating and air conditioning, first from the standpoint of initial cost and second, from the standpoint of operational cost".

The table below shows *Thermopane's* effectiveness in cutting down heat transfer by conduction and convection from the warm to the cold side. *Thermopane* saves, roughly, half of the money that would be wasted through single glass by these forms of heat transfer.

Kind of Glass	Thickness	Winter U. Value	Summer U. Value
Single pane (plate or sheet)	⅛″	1.16	1.07
	¼″	1.15	1.06
Thermopane (double-pane units)	⅛″ (¼″ air space)	.65	.61
	1″ (½″ air space)	.58	.56

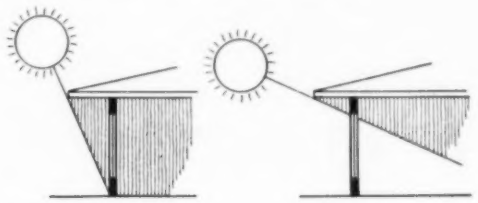
NOTE: Heat transmission coefficients (U. values) vary with ranges of temperature. Winter U. values above are based on 10° outside temperature, 70° inside temperature. Summer U. values are based on 95° outside temperature and 80° inside temperature. Wind velocity of 15 mph outdoors and normal free air movement inside are assumed in both cases.

HOW TO PLACE WINDOWS IN AIR-CONDITIONED HOMES

Insulation, alone, is not enough. Location and exterior shading of windows are vitally important if heating and air conditioning are to work with maximum effectiveness and economy. Energy from the sun and sky place by far the biggest load on air-conditioning systems in homes. The house should be located to make maximum use of the sun for winter warmth, but must have provision for shading certain windows in summer.

SOUTH WINDOWS

To make maximum use of solar heating in winter, the house should be laid out along an east-west axis, with large windows facing south. This brings in the low winter sun for fuel savings and comfort. South windows are easily protected from high summer sun by a roof extension (so designed that the low winter sun enters under it). The diagrams below show how this works. For correct design information for this overhang, see an architect or engineer. Most of them are equipped with the necessary guides to figure it out for your latitude.



Sun angle on June 21. Sun angle on December 21.

This exterior view shows how Architect Welch provided a roof overhang to shade south windows from the sun in summer.

WEST WINDOWS

West windows must be more carefully considered than those on other elevations. Due to the buildup of heat through a hot summer day and the fact that the west elevation is exposed to the low afternoon sun, heat transmission through west windows can place a great load on the air-conditioning system. There are several possible ways to handle the west elevation problem:

1. Some architects and builders solve this problem by placing the porch, garage, carport or utility room on this side of the house.

2. If there are large trees on the site (or if they can be added) to shade west windows, the problem is solved by nature. The leaves provide summer shade—the bare branches let the welcome winter sun come through.

3. Heat absorbing glass is an effective means of decreasing solar heat gain. This blue-green glass is made with a special chemical composition which enables it to absorb solar energy. Much of this heat is dissipated back outdoors, so that less load is thrown on cooling equipment. For best results in west windows, therefore, *Thermopane* should have heat absorbing glass as the outer pane. This heat absorbing *Thermopane* reduces the heat gain through west windows approximately 50% as compared to single-pane, clear glass windows. This has been determined by calculations made for west windows at 4:00 P.M. in summer, when the sun is considered to be at its worst angle. By reducing the cooling load, heat absorbing *Thermopane* may even reduce the size of the air-conditioning equipment required for the home.

EAST AND NORTH WINDOWS

North windows rarely present a problem of radiant heat gain. Windows in the eastern elevation, if exposed to the morning sun, may require shading as suggested for western windows. An engineer's or architect's recommendations should be obtained on this.

TYPES OF SASH TO USE

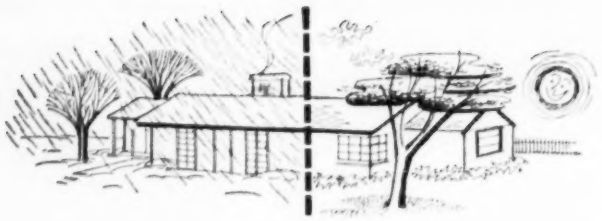
Some architects and builders employ fixed sash in air-conditioned homes, relying on the heating and air-conditioning system to provide ventilation. In some cases, louvers or other kinds of openings are used for supplementary ventilation. Fixed sash are usually economical and they do away with the need for insect screens in windows. Standard picture window and window wall frames are available from a number of manufacturers through their dealers—frames of wood or metal. These frames take standard sizes of *Thermopane* insulating glass which is readily available from L·O·F Distributors and Dealers.

However, many people will insist upon having ventilating sash in their homes for psychological reasons and because they may want to use natural ventilation in the more moderate seasons of the year. Their preferences can be satisfied with ventilating sash which take standard *Thermopane* units. These sash, of wood or metal, are available in all common types. Your L·O·F Glass Distributor or Dealer can furnish information about them and about standard *Thermopane* units for them. Or, write us if you wish more complete information on *Thermopane*, its standard sizes and types of sash for it.

These two pages are a condensation of a brochure that covers the entire subject more fully with additional technical supporting data. We shall be pleased to have you write for a copy of "Glazing the Air-Conditioned Home".

Libbey·Owens·Ford Glass Company, 2653 Nicholas Building, Toledo 3, Ohio

LIBBEY·OWENS·FORD *a Great Name in* **GLASS**



Now—for the booming residential air conditioning market

A FULL LINE OF RESIDENTIAL AIR CONDITIONING CONTROLS BY HONEYWELL!

Here they are! A full line of air conditioning controls by Honeywell—featuring a fine heating-cooling thermostat—that can make it easier for you to cash in on the rapidly expanding residential air conditioning market.

This wide selection of proved equipment for residential air conditioning enables you to handle any job. To help you, Honeywell maintains a nation-wide network of branch offices so service and information on control equipment are always close at hand.

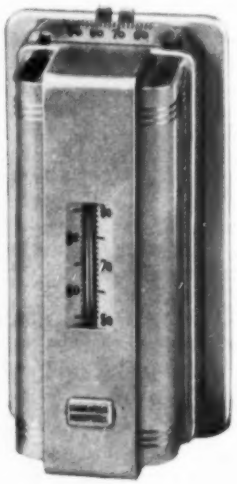
But of most importance, you're always in a better competitive position when you can install a Honeywell-controlled job. Architects, contractors and customers alike know Honeywell's world-wide reputation for high quality precision controls—which means you can be sure of complete customer acceptance.

Contact one of Honeywell's 104 key city offices and get all the facts on this complete line of domestic air conditioning controls. If you prefer literature by mail, send coupon below.

Honeywell Year 'round Thermostat

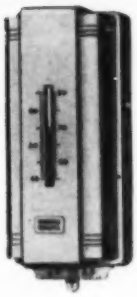
The T823A is really two thermostats in one! This fine-quality instrument makes it possible to offer convenient *finger-tip* control of heating and cooling equipment the year 'round.

The heating action of the T823A incorporates Honeywell's famous heat-actuation principle that gives maximum efficiency in cycling the burner. The sensitive cooling thermostat operates the cooling equipment dependably and accurately. Each thermostat can be set independently of the other—so complete automatic control may be realized.



T828A Two-Stage Thermostat

The T828A cooling thermostat has two stages which make contact, in sequence, on temperature rise, without using a heater element. A single indicator for setting the thermostat provided. The differential between stages is approximately 2 degrees.



T44B Cooling Thermostat

The T44B is a well-designed cooling thermostat. It has a scale range of 64 to 96° F. The differential is adjustable, from a minimum of approximately 1½ degrees. The contacts are rated for low voltage or light-duty line voltage.

Q18 Thermostat Subbases

Several Q18 subbase models are available. When used with T823A or T828A, the Q18E is available with HEATING-OFF-COOLING positions of switch, or the Q18D with switching action to permit selecting constant or automatic fan operation on cooling. Q18C, for use with T44B, has switch positions marked HEATING-OFF-COOLING.

H64A Humidity Controller

This simple, low-cost humidity controller incorporates a sensitive hair element and a MICRO enclosed snap switch. Switching action is SPDT, permitting control of a two-wire or three-wire circuit for humidification or dehumidification. The scale range is 20 to 80 percent RH.

TM81C Comfort Thermostat

This popular model, which has established itself as the standard thermostat for domestic heating control, is recommended for control of the heating cycle in applications where a two-stage cooling thermostat is used on the cooling cycle.

Q277B Heating-Cooling Subbase

The TM81C is shown mounted on a Q277B Subbase, which incorporates a two-position switch with positions marked HEATING and COOLING. The switch may be used to actuate a relay for changeover from heating to cooling operation.

M828 Damper Motor *R492 Controller* *R882 Relay*

Complete line of relays, controllers and damper motors available

Here are representative models from the complete line of accessory controls needed for residential air conditioning jobs.

MINNEAPOLIS **Honeywell**

First in Controls

Minneapolis-Honeywell Regulator Company
2727 Fourth Avenue South
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Minneapolis 8, Minnesota
Gentlemen:
Please send me your new booklet "Summer-Winter Controls for year 'round residential air conditioning."

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Address _____

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our "speed specialist" keeps your order on the move!

• As soon as your order is ready, our traffic manager gets it out of our warehouse and into your plant as fast as possible. If you specify delivery or routing instructions, he will see that they are followed exactly. If you leave the routing up to him, he will schedule delivery so as to give you the best possible protection in the matters of both cost and service.

When your order needs special handling, you can get the *personal* attention of our traffic manager through your U. S. Steel Supply salesman.

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Coast to Coast

UNITED STATES STEEL

Selling Price MINUS Original Cost MINUS Installation Expense EQUALS DEALER'S PROFIT

EVER WONDER why it is the SEQUOIA dealer consistently gets the close-margin heating jobs? Ten-to-one his secret is simply this: SEQUOIA knows the importance of installation costs in every dealer's profit formula. And so its gas furnaces are carefully designed for fast, easy (profitable) installing!

CLOSET'EER models, for example (the wide face-shallow depth series that is such a big seller for today's modest-cost homes) are an installer's favorite! All controls are conveniently grouped right on the face . . . every duct, vent, gas and electrical connection is within easy arm's reach!

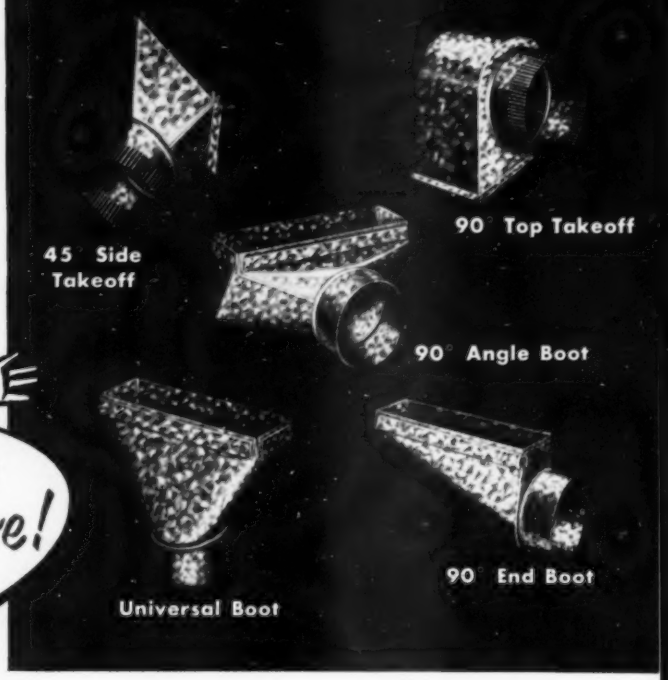
HORIZONTALS . . . and Sequoia makes 5 of 'em, 70,000 to 150,000 BTU . . . also are compactly engineered for easiest handling. A special point: they'll pass through most scuttle holes without case disassembly.

If it's important to you to handle top quality gas furnaces that are competitively priced . . . profitable to install . . . and trouble-free performers, write for information regarding a SEQUOIA dealership. Address your letter to—

Sales Department

SEQUOIA MANUFACTURING CO.

1000 BRITTAN AVENUE
SAN CARLOS 3, CALIFORNIA



MILCOR* 4" fittings

precision-engineered for 4"-pipe systems

New additions to the industry's most complete line of furnace pipe and fittings . . .

Yes, sir, now you can get a complete line of Milcor Galvanized Fittings for 4"-pipe systems — including side and top takeoffs, various types of boots, and accessories such as floor register pans, casing collars, etc.

Like all Milcor fittings and accessories, these new Milcor units are designed to give you snug, solid joints — without special tools. You reduce installation time—make a better profit on every job.

Milcor Catalog 500 gives you list prices and specifications on these and other Milcor Furnace Pipe and Fittings. If you don't have a copy, write for it on your business letterhead.

*Reg. U. S. Pat. Off.

S-116

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Here's more good news!

News Round-Up

Home Cooling Installations Lead in Fort Worth

RESIDENTIAL INSTALLATIONS of air conditioning during 1952 in Fort Worth, Texas, led the parade both in number of jobs installed and in total tonnage, as compared with all other installations, according to figures compiled by the Fort Worth commercial department of the Texas Electric Service Co.

Average tonnage of the 226 residential installations — which totalled 1379 tons — is 6 tons; the largest has a 48 ton capacity. A breakdown by sizes shows there were:

No. of Jobs	*Size (Tons)*	*Total Tons*
11	2	22
40	3	120
2	4	8
104	5	520
8	6	48
1	7	7
19	7½	142½
11	8	88
1	9	9
15	10	150
2	11	22
2	12	24
4	15	60
1	17½	17½
1	22	22
1	25	25
1	30	30
1	48	48

(A merchandising plan for the promotion of residential air conditioning in Fort Worth is outlined on page 72.)

Indiana Contractor Gets $30 Million Contract

GEORGE KOCH SONS, INC., Evansville, Ind., sheet metal contractor, recently was awarded a $30 million defense subcontract. The work includes the installation of all sheet metal and allied work such as heating, cooling and ventilating systems, and other jobs common to the industry, at the Atomic Energy Commission's new gaseous diffusion plant near Portsmouth, Ohio. Peter Kiewit Sons Co. is the general construction contractor for the project. The subcontract was awarded on a cost-plus-fixed-fee basis. It is estimated that it will take over four years to complete this sheet metal work.

NHWA To Hold Spring Convention at Asheville

THE NATIONAL HEATING Wholesalers Association will hold its spring convention at the Grove Park Inn, Asheville, N. C., on June 22, 23 and 24. A trustees' meeting, convention and business meetings are tentatively scheduled for Monday, June 22. Reports will be heard from the committees on membership, statistics, and publicity and advertising. Golf tournaments will be held on Tuesday, and facilities will also be available for swimming, tennis and horseback riding. The ladies' program includes sightseeing tours, a putting contest, bridge, etc.

Illinois Contractors Elect Guenther President

CLIMAXING THE 39TH annual convention of the Sheet Metal Contractors Association of Illinois, held in Peoria, April 15-16, was the nomination from the floor — and subsequent election — of Rudy Guenther of Chicago for president. The nominating speech was made by R. Tippett of Waukegan.

Other officers elected were: George Bushman, vice president; E. A. Schmidt, secretary; and Frank Eynatten, treasurer. A full report of this meeting will be presented in the June American Artisan.

Urban Building in South Increases

VALUE OF URBAN BUILDING in the South, including alterations, additions, and repairs, as well as new residential and non-residential construction, during January advanced approximately 11 per cent over the January 1952 level, while total national valuations increased about 9 per cent, according to Brunswick A. Bagdon, Southern Regional Director, U. S. Department of Labor's Bureau of Labor Statistics. Eight of the 14 southern states showed increases of from 8 per cent (in Georgia) to 77 per cent (in Tennessee).

Construction Total Up Over First Quarter of '52

F. W. DODGE CORP. announced recently that its March figures for construction contract awards contained in the Dodge reports carried the total for the first quarter to 11 per cent over the first quarter of 1952, in the 37 states east of the Rockies.

For March, the residential figure was $605,200,000, up 45 per cent over February and 2 per cent above March 1952.

Non-residential awards in March were $449,175,000, or 20 per cent more than February, but 3 per cent less than March 1952. Heavy engineering (public works and utilities) totalled $293,143,000, or 28 per cent more than February and 11 per cent more than March 1952.

Three-month 1953 figures compared with three months

News Round-Up

of 1952 were: non-residential, $1,230,110,000, up 10 per cent; residential, $1,433,804,000, up 12 per cent; heavy engineering, $730,482,000, up 11 per cent.

Discusses Cut in Defense Spending

THE EFFECT OF CURTAILMENT of defense spending on manufacturing was discussed by Walter Williams, Under Secretary of Commerce, U. S. Department of Commerce, in a recent address delivered to the manufacturing conference of the American Management Association. Secretary Williams pointed out that the productivity curve is steadily rising. "Increase in productivity means increase in real wages", he said. "As real wages increase, purchasing power increases, and thus the ability of consumers to consume the output of our great industrial plant increases."

He said that the curtailment of defense expenditures means lessened budgets, which will reduce the tax load, and thus more money will be available for businesses as well as individuals. "If we look at the tremendous potential strength we possess as individuals, as businesses, and as a nation", he stated, "we should be able to make any adjustments that need be made in our national life with a minimum amount of disturbance."

Greatest Air Conditioning Potential Is Residences

TOTAL 1953 RETAIL SALES of the air conditioning industry may approach the $2 billion mark, according to Cloud Wampler, president, Carrier Corp. This figure would include all types of air conditioning equipment — for plants, office buildings, hotels, apartment houses, stores and homes, as well as room air conditioners — plus the cost of installation. "The greatest growth potential in the field is the year 'round air conditioning of residences", Mr. Wampler said. "I am sure that year 'round units for homes will rapidly overtake room air conditioners in dollar volume. Year 'round air conditioning for homes should, within the next 10 years, become the greatest single part of the business, amounting to about 35 per cent of total industry sales."

Need for More Engineers Stressed

THE NEED FOR MORE ENGINEERS to serve all phases of industry, from research to installed product, was stressed by a number of speakers at the 21st annual national meeting of the American Society of Tool Engineers. Kenneth Meade, General Motors Education Relations Section Head, said that the United States was 95,000 short of having enough engineers.

Fuel Advisory Services Urged by UN Committee

AT A MEETING IN GENEVA of delegates from 16 countries, the coal committee of the United Nations Economic Commission for Europe recommended that member governments consider the adoption of measures designed to promote the more efficient use of solid fuel. Several recommendations for fuel advisory service were made.

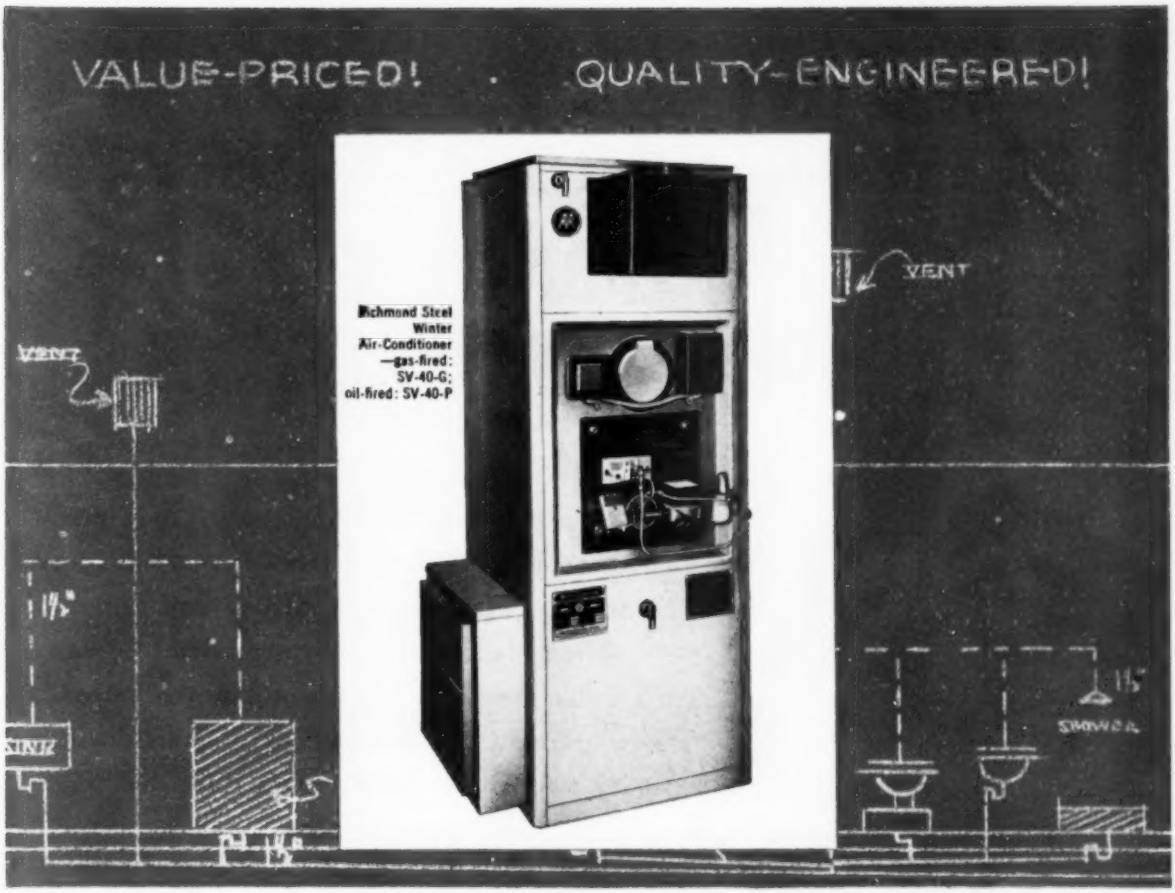
In countries where they do not already exist, the committee suggested, fuel advisory services, enjoying the support of governmental authorities and assisting all classes of consumers, could be set up. Producers, consumers, manufacturers, and distributors should be invited to help in forming such services. In countries where such services already exist, steps could be taken to ensure that they are in a position to perform their tasks effectively. The committee also suggested that government authorities should help professional groups and associations to set up "thermal centers" designed to help industrialists improve their installations and to guide plant owners in choosing the right kind of new equipment by taking into account the grades of fuel available.

Steelmakers Increase in Number

MORE COMPANIES are making steel now than 14 years ago, according to a comparison of the 1939 and 1953 steel capacity lists of American Iron and Steel Institute. Eighty-four companies are now listed as steel ingot producers, a net gain of 11 companies since 1939. The current list contains 24 companies not listed as ingot producers in 1939. Some of these entered the industry only within the past 14 years. Others, previously only processors of steel, have installed steelmaking furnaces. Steel is now being made in 27 states, compared with 24 states in 1939. The number of steelmaking plants has increased to 143 from 128 in 1939.

Propose Gas Pipeline Facilities for Northwest

THE FEDERAL POWER COMMISSION has consolidated two additional applications with the hearing now in progress in Washington, D. C., on proposals for the importation of natural gas from Canada and the construction of pipeline facilities to serve markets in the Pacific Northwest. The new applications are by Colorado Interstate Gas Co., Colorado Springs, Colo., and Colorado-Wyoming Gas Co., Denver.



Now! A new heating unit for Sure-Fire Efficiency...Sure-Fire Sales!

This new Richmond vertical winter air-conditioner is designed to fulfill the heating needs of small homes and apartments. It offers your customers outstanding efficiency at an exceptional value . . . offers your gas-heating line an unusual profit opportunity.

The Richmond SV-40-G with an 85,000 BTU/HR input is a fully automatic, factory-assembled, gas-fired unit that is AGA approved. Other features include a light-green hammertone jacket, a 12-gauge heat exchanger and a large-size, slow-speed blower.

Each Richmond SV feature is quality-engineered for maximum heat output and for extremely economical operation. And each feature in this new Richmond unit reflects the most in-demand requirements of today's homeowners.

RICHMOND PLUMBING & HEATING

RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

See your wholesaler or Mail Coupon Today

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Richmond Radiator Company
19 East 47th Street, New York 17, New York

Please send me more information and literature on the new Richmond SV heating unit. No obligation, of course.

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We are ☐ heating wholesalers ☐ heating contractors ☐ building contractors.

TWO NEW CRESCENT SCREWDRIVERS FEATURE TENITE HANDLES

K1300 and K1500 series

K1700 series

● Here's typical Crescent quality in a new line of plastic handled screwdrivers! Blades are hot forged and hardened full length. Then blade and handle are assembled under pressure so blade will never loosen. Finally, each screwdriver is individually tested to insure blade tips that will not break or twist.

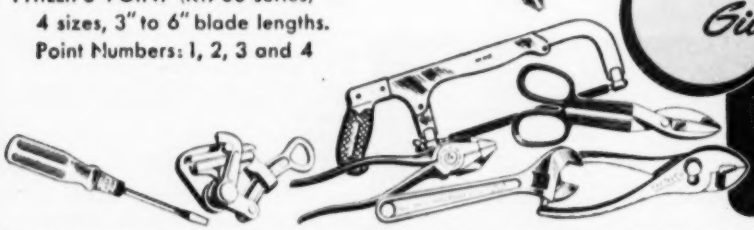
You'll recognize these new Crescent Screwdrivers by their distinctive blue-colored Tenite handles, with soft-edged knurling that assures a sure grip without blistering the hand. Two patterns for slotted screws . . . one for Phillips head screws . . . in the sizes listed below.

STANDARD PATTERN (K1300 series)
5 sizes, 3" to 10" blade lengths.

CABINET PATTERN (K1500 series)
4 sizes, 3½" to 8½" blade lengths.

PHILLIPS POINT (K1700 series)
4 sizes, 3" to 6" blade lengths.
Point Numbers: 1, 2, 3 and 4

CRESCENT TOOLS
Give Wings to Work
®
Sign of the Artisan
Symbol of Excellence



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

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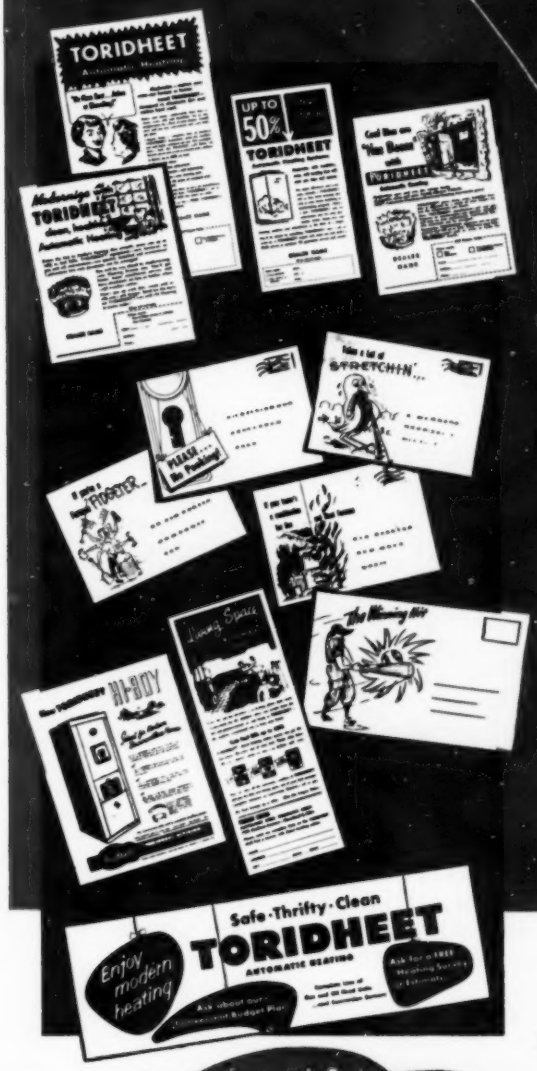


Fireball

"Modernization" Promotion

Now's

The Pioneer Rotary Wall Flame Oil Burner

Toridheet units for every need . . . every budget . . .
Rotary Wall Flame Burners . . . Gas Burners . . . Rotary Fired Boilers and Furnaces . . . Gun Fired Boilers and Furnaces
. . . Gas Conversion Burners and Gas Fired Furnaces

CLEVELAND Toridheet AUTOMATIC HEATING

TORIDHEET DIVISION
CLEVELAND STEEL PRODUCTS CORPORATION

Affiliated Canadian Manufacturers: Conroy Mfg. Company, Ltd., Catharine St., St. Catharines, Ont.

THE BEAUTIFULLY STYLED

Aerofuse

TYPE "P" SERIES

CEILING DIFFUSER

Aerofuse — a famous name in diffusers — is now presented in an entirely new design that sets a new high in appearance and performance at the vital point of air delivery.

BEAUTIFULLY STYLED, the four diffuser types in the new line feature matching facial contours. All sizes have the same number of rings. Thus uniform appearance is assured when more than one type, or various sizes, are installed in a conditioned space.

TYPES AVAILABLE . . . Type "PA" provides pattern adjustability. . . . Type "PF" is a fixed pattern diffuser . . . Type "PS" high capacity diffuser for industrial applications . . . Type "PR" supply and return diffuser.

For complete details, write for Catalog No. 105.

TUTTLE & BAILEY INC

NEW BRITAIN, CONNECTICUT

SENSATIONAL NEWS

for the

GAS HEATING INDUSTRY!

HONEYWELL'S

completely new

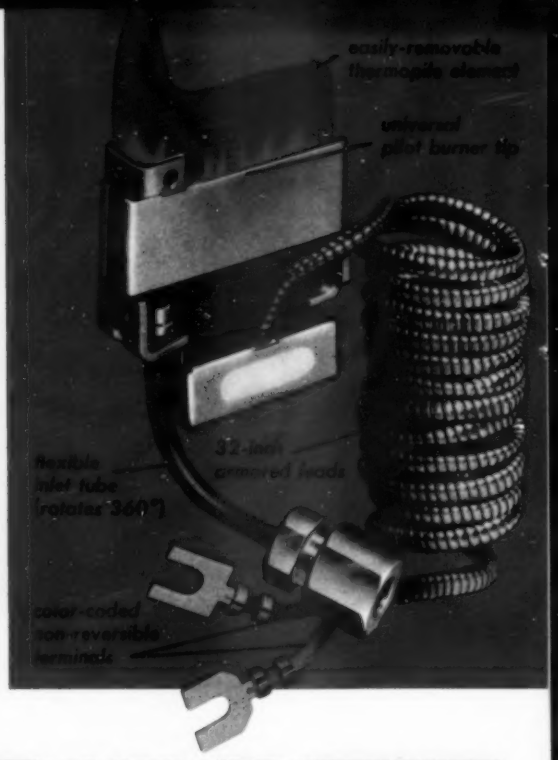
SELF-POWERED

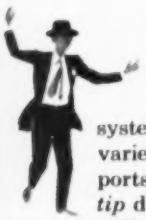
CONTROL SYSTEMS

- Reduce and simplify maintenance and service
- Cut installation procedures and costs
- Minimize ordering, stocking, and handling
- Provide greater customer satisfaction

Honeywell's Revolutionary CS82 Powerpile

A BLUE FLAME PILOT THAT USES NO PRIMARY AIR—The new Honeywell CS82 Powerpile pilot is a radical change from the Bunsen-type pilots so familiar to the gas heating industry. Air is inspirated only at the point of combustion rather than at the pilot burner orifice. *There are no primary air holes to plug, clog or gum . . .* no need for lint screens . . . no air adjustments. Considerably *less gas is consumed* and combustion is always *quiet and complete.*

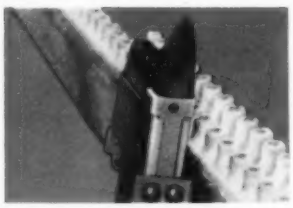


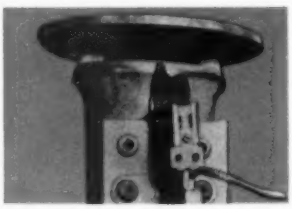


One Pilot Burner Tip, not a dozen

The CS82 Powerpile utilizes a *common thermopile-pilot flame* to supply operating current for the system and ignite the main burner. The need for a wide variety of burner tips and the possibility of plugged ignition ports or carry-around slots is eliminated — *one universal burner tip* does the job.

Exhaustive tests and trials have proved that this universal pilot burner is capable of providing positive ignition on practically all standard burner applications. An additional model is available with a flash tube for the few applications where main burner design does not permit mounting the pilot immediately adjacent to the main burner ports.





Greater Output, Smaller Size

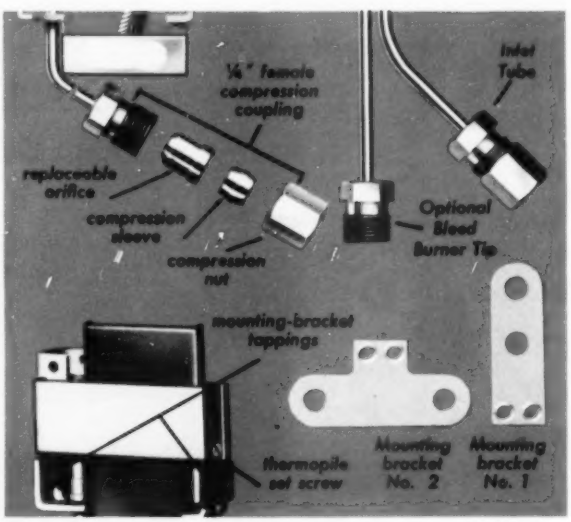
The new CS82 Powerpile design features a thermopile element with more thermocouples, less mass, and increased internal resistance. As a result, *more power* is available, *safety shutdown is appreciably faster*, and control circuit resistance variations are far less critical.

Fewer Models . . . More Easily Applied

Model variations as well as all critical dimensions have been reduced considerably. In addition to the universal burner tip, the standard pilot-burner orifice may be used for *all street gas* (including natural, sulphur-bearing, mixed, manufactured, or 1400 Btu butane-air mixtures). Two additional orifices (one for LP, one for 525 Btu LP-air) are available to make a single model Powerpile Unit *suitable for all types of gas.*

The flexible inlet tube, plus the two mounting brackets furnished, simplify connecting, mounting, and locating the Powerpile Unit. In addition, each unit is designed to accommodate a bleed burner tip which is available, when required.

The separate thermopile element is secured to the pilot burner by a single set screw and may be easily reversed to make the flexible armored leads more accessible. Similarly, it is a simple matter to replace a thermopile element in the field without removing the pilot burner assembly.



New Honeywell Y400 Powerpile Thermostat-Valve Packages

MORE WORK FROM A SMALLER VALVE—The VS87 is an electric-actuated diaphragm gas valve featuring a self-contained, polarized relay which utilizes a permanent magnet to amplify the power furnished by the Powerpile Unit. The additional work energy available permits the use of *larger porting in the actuator* which, in turn, speeds up valve action and virtually eliminates any tendency to clog.

Of particular importance is the reduced size of the VS87 valve actuator which makes the Y400-CS82 Powerpile Systems especially suited to small gas appliances.

The use of stainless steel and anti-corrosive plating for metal parts plus an eight-ounce pressure rating make one valve model *suitable for all gases* including sulphur-bearing and LP. In addition, the need for right-hand and left-hand models has been eliminated by placing the terminal panel over the valve inlet. *A terminal screw for every wiring connection* simplifies installation and service and assures tight, low-resistance connections.

One Model For Every Job

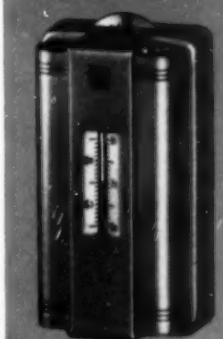
A Thermostat For Every Whim

WHEN ECONOMY IS A MAJOR CONSIDERATION, Honeywell's *new* TS827 Powerpile Thermostat (Y400A Package) is the answer. It provides accurate temperature control and features a bimetal-actuated mercury switch unaffected by lint or dust, an easy-to-read cover thermometer, and a convenient "Hi-Lo" setting scale.

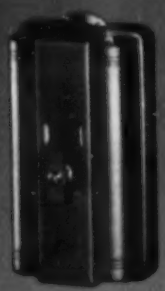
FOR DELUXE COMFORT in a conventional manual thermostat, your customers will want the T804B Powerpile Thermostat (Y400B Package). In addition to a bellows-actuated mercury switch, it features the "Heat Leveling" principle which smooths out room temperature fluctuations.

SELL COMFORT *PLUS* CONVENIENCE with Honeywell's famous Day-Night thermostats. Both the TM801 Time-O-Stat (Y400C Package) and the TM850 Electric Clock Thermostat (Y400D Package) are available for use with the new CS82 Powerpile.

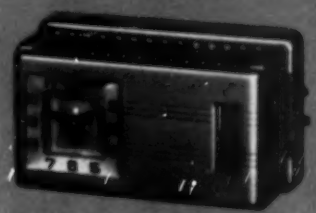
Y400A POWERPILE PACKAGE includes TS827 Powerpile Thermostat



Y400B POWERPILE PACKAGE includes T804B Powerpile Thermostat



Y400C POWERPILE PACKAGE includes the famous Honeywell TM801 Comfort Time-O-Stat which provides for manually-lowered night temperatures with automatic pickup in the morning.



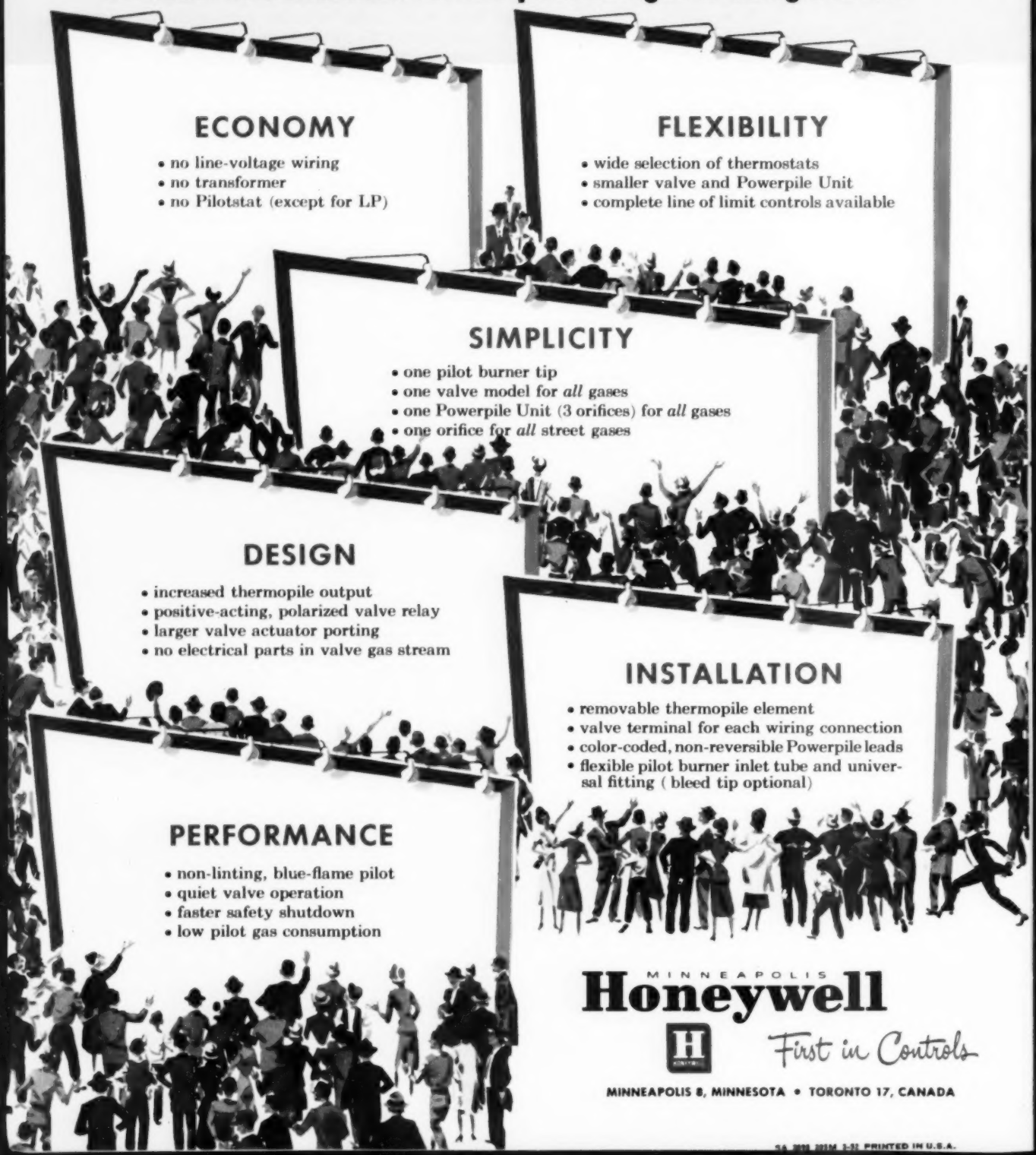
Y400D POWERPILE PACKAGE includes the TM850 Comfort Chronotherm featuring an electric clock which automatically lowers the temperature at night and restores it in the morning. (Clock requires electrical connection.)

In addition to the thermostat, all Y400 Packages include a VS87 Valve, thermostat cable and insulating staples.

NUMBERS TO REMEMBER!

Y400-CS82

for NEW STANDARDS in self-powered gas heating control



ECONOMY

- no line-voltage wiring
- no transformer
- no Pilotstat (except for LP)

FLEXIBILITY

- wide selection of thermostats
- smaller valve and Powerpile Unit
- complete line of limit controls available

SIMPLICITY

- one pilot burner tip
- one valve model for *all* gases
- one Powerpile Unit (3 orifices) for *all* gases
- one orifice for *all* street gases

DESIGN

- increased thermopile output
- positive-acting, polarized valve relay
- larger valve actuator porting
- no electrical parts in valve gas stream

INSTALLATION

- removable thermopile element
- valve terminal for each wiring connection
- color-coded, non-reversible Powerpile leads
- flexible pilot burner inlet tube and universal fitting (bleed tip optional)

PERFORMANCE

- non-linting, blue-flame pilot
- quiet valve operation
- faster safety shutdown
- low pilot gas consumption

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Honeywell

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MORE THAN EVER . . .
A *POSITIVELY*-LOCKED,
EASILY-ASSEMBLED
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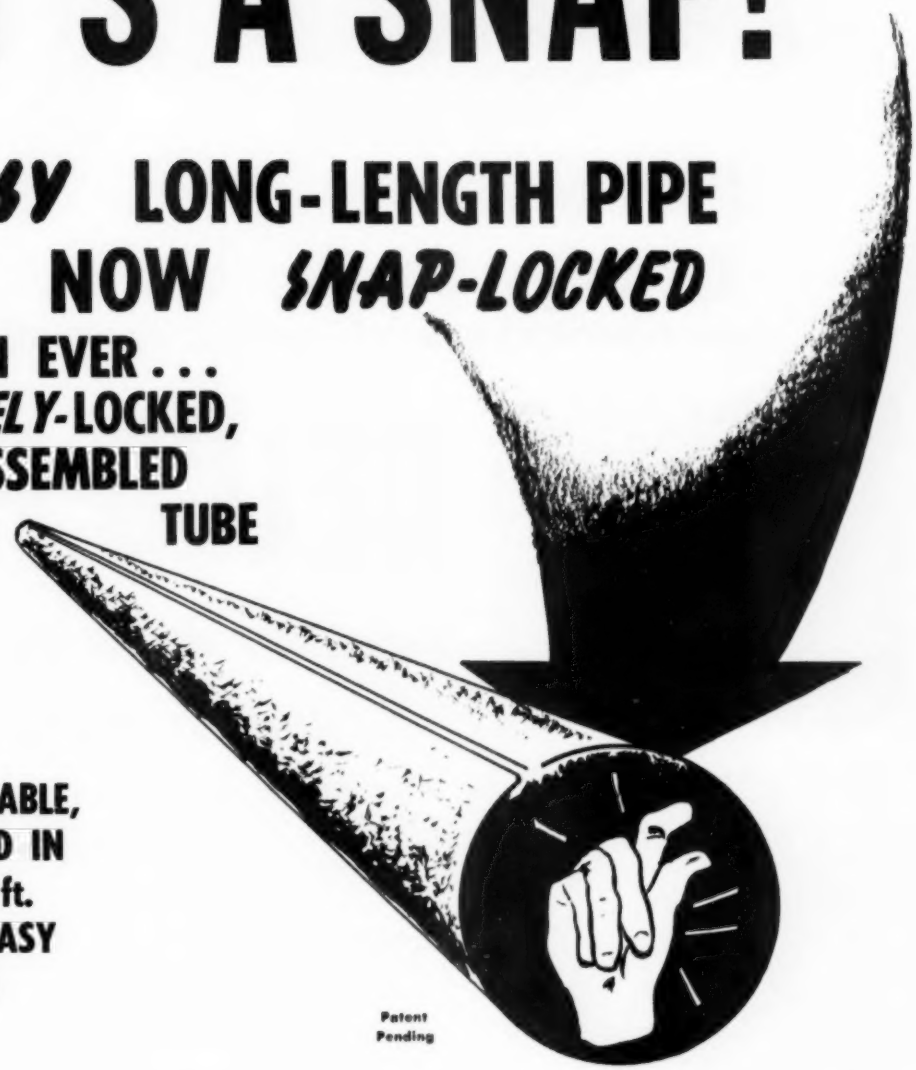

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Quick action heat transfer unit delivers more heat to home, less to chimney. Capacity 75,000 Btu. per hour. Centrifugal Blower and Burner driven by Delco-built, quiet, vibration-free Rigidframe motor. High and low models, and Reverse Flow for perimeter heating.

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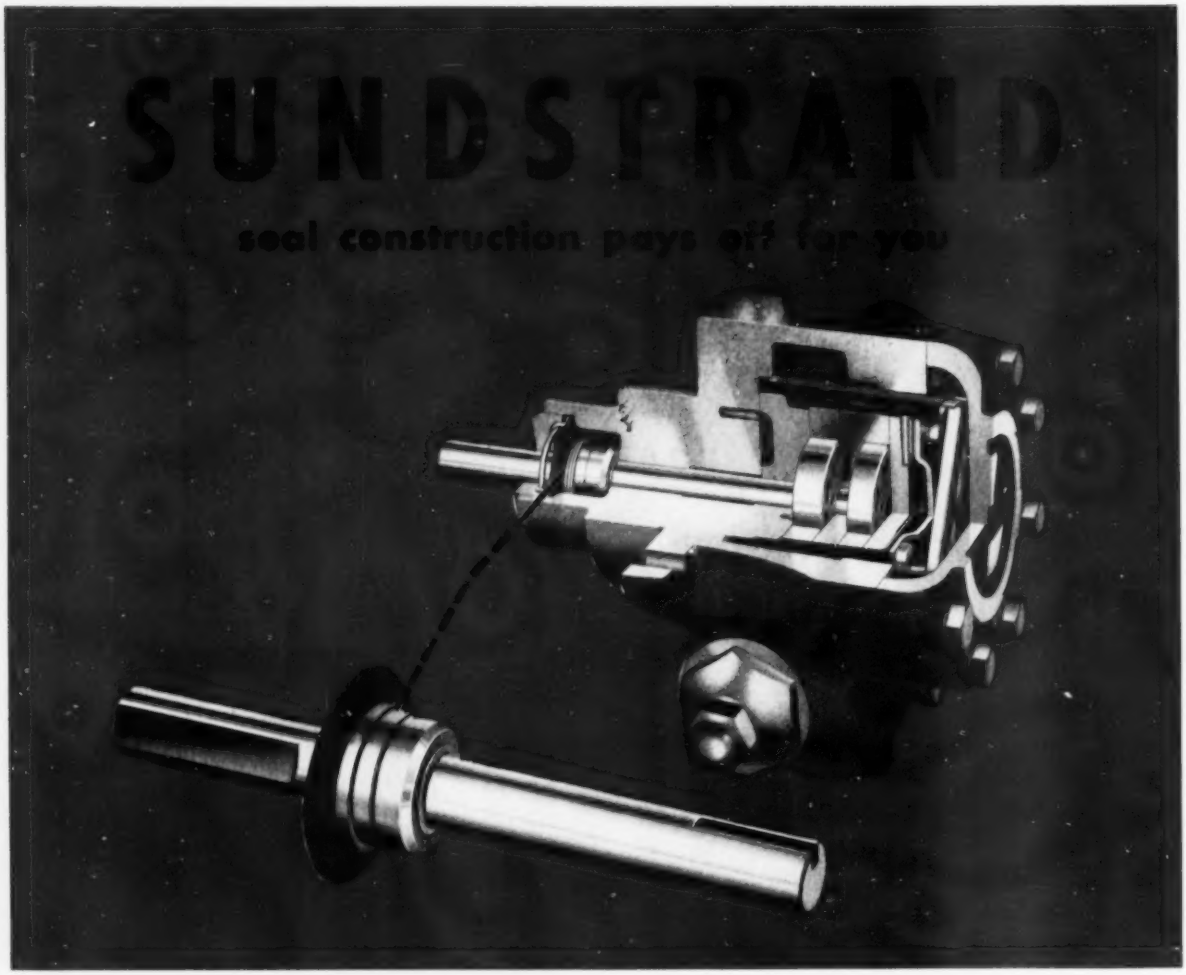

Glass-hard Nitraloy disc mirror-finished to within $\frac{22}{1,000,000}$ of an inch!

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For 3, 6, 10, 14 and 20 Gph firing rates . . . Strainer capacities—6, 10, 15, 20 Gph . . . Solenoid Valves optional on factory assemblies only . . . interchangeable with earlier models.

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• The time to solve trouble calls is before they happen. That's why Sundstrand puts so much into the manufacture of a simple pump-shaft oil seal—to give you full protection against leaks over the life of the Fuel Unit. What does this protection involve in the way of engineering and precision?

First, it involves a special nitriding process for the seal. This gives it a glass-hard outer skin—94 Rockwell, 15N—that resists even the slightest wear over years of hard service.

Second, each seal is lapped to a mirror finish, flat within $\frac{22}{1,000,000}$ of an inch. This operation is checked by measuring with monochromatic light waves under an optical flat.

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Simple design? Yes—and what an advantage it is, should servicing be necessary.

The pump-shaft seal, proved by 15 years of successful use, is another reason why Sundstrand is first in Fuel Units. Write for latest data and prices on Sundstrand Models "J" and "H".

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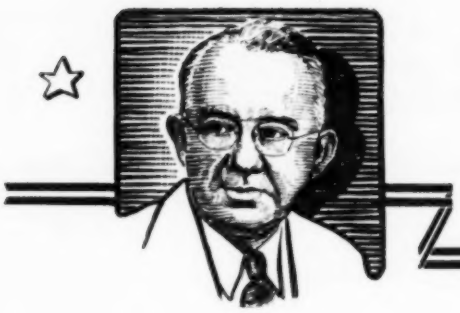

Arnold Kruckman's

Washington Letter

"In's and Out's" of Title I Loans

THERE ARE NOW a half billion more dollars added to the Federal Housing Administration authorization to insure unsecured bank loans for repairs, alterations or improvements to homes in town and country, as well as non-residential and non-farm structures. In addition, each month, FHA restores approximately $75 million to its Title I insurance loan authority by reason of the fact that earlier insurance loans have been made available because the insured loans have been amortized and prepaid. This gives FHA an annual gross total of $900 million insurance resources, plus the $500 million which just recently was provided by Act of Congress. It is estimated, both by FHA and Congress, that these total resources of $1,400,000,000 will be sufficient to accommodate the volume of the eligible property-improvement loans through the end of June, 1954.

Title I was originally enacted in 1934 to avoid the need for mortgage procedures to make improvements to existing homes and other small buildings. The primary function of Title I is "to provide a sound workable program for home repair activity" without delay and without the usual securities. The Act was originally passed as an emergency measure in a time of urgent need. It was found so successful for moderate undertakings that it was renewed in 1950, and now will be in force until June 30, 1955. It is so useful that it will probably become a permanent part of Government service.

It works this way: Any proper financial institution may apply to the FHA for the privilege of utilizing Title I insurance facilities. This includes national banks, state charter banks, finance companies, savings and loan associations, and other bona fide lending institutions. When accepted by FHA, the bank or finance institution is empowered by contract to arrange loans with dealers, contractors, manufacturers, anyone who supplies equipment or services, or with those who wish to make the repairs, or improvements upon the structures they may own; it makes such loans in accordance with regulations prescribed by FHA.

Program is Self-Sustaining

The FHA insurance of the loans guarantees that 10 per cent of the totality of such loans, made by the financial institution, will be paid. In other words, the actual default of those who borrow the money has been so nicely calculated that in almost every instance the financial institution is reimbursed 100 per cent for all losses.

At this time there are nearly 5000 lending institutions which hold insurance contracts under Title I with FHA. From the start of FHA operations in 1934, through 1952, over 14,300,000 loans have been insured, amounting to $6,150,000,000. During that time FHA has paid a total of 435,000 claims, with a dollar amount of about $133 million. The ratio of claims to loans covered is about 2.17 per cent. FHA is certain that it will recover over $67,300,000 of the claims paid, which would make the total of unrecovered claims only 1.7 per cent of the amount of loans covered under the Title I program. It is further interesting to learn that the Title I program is self-sustaining. Its income has been $98 million, with total disbursements of about $71,500,000, leaving paid-in capital and surplus at about $26,500,000.

Generally speaking, improvement and repair loans under Title I mature in three years, or less, and currently average about $600 each. The vast majority of Title I loans carry a maximum financing charge which may not exceed an amount equivalent to a $5 discount per $100 original face amount of a one-year loan, to be paid in equal monthly installments calculated from the date of the note. This gives a ratio of about 9.7 per cent of total

Washington Letter

charge paid by the borrower to the average amount of the outstanding debt during the period of the loan. The FHA insurance premium charge, for the typical small loan under Title I, is three-fourths of one per cent per year of the net proceeds of each loan reported for insurance. The Title I premium charge is not in addition to the financing charge, but must be paid by the lending institution and may not be passed back to the borrower. This reduces the 9.7 per cent rate to an effective rate to the lender of about 8 per cent.

Primary Provisions Digested

As of March 4, primary provisions for Title I loans are digested thus:

Class 1 (a), for repair, alteration or improvement upon or in connection with existing structures, farm and non-farm, maximum loan insured, $2,500. The loan may run three years and 32 days.

Class 1 (b), for alteration, repair, improvement or conversion of existing structures, farm and non-farm, two-family or more intended use, maximum loan insured, $10,000. The loan may run seven years and 32 days. The interest rate is $5 discount per $100 face amount per year. If the sum is in excess of $2,500, the discount is $4 per $100 per year. The insurance premium is ¾ per cent per annum of the loan; on loans over $2500 it is ½ per cent per annum.

Class 2 (a), for new construction other than residential or agricultural use, maximum loan, $3000. The loan may run three years and 32 days. There is the $5 discount per $100 per year with ¾ per cent per annum for insurance.

Class 2 (b), to finance new non-residential farm construction, the maximum loan is $3000 to run seven years and 32 days; or, if secured by first lien, 15 years, 32 days. There is the usual $5 discount per $100 per year, except if the maturity is over seven years and 32 days, in which case the discount is $3.50 per $100 per year.

Under Section 8 of Title I — construction begun after April 20, 1950 — if intended for owner-occupancy or sale, it may be insured by the owner-occupant for $4750, or by the operating builder for $4250. The loan may run 25 years with an interest rate of 4¼ per cent; an insurance premium of ½ per cent, and service charge of ½ per cent per annum is permissive.

In all loans (except Section 8, New Home Loans) the insurance premium is included in the discount.

Most Loans Made Through Dealers

FHA finds that lending institutions prefer to do business with those who supply the equipment or materials or the services for the improvements or repairs to the various types of structures. In the great majority of cases the contractor or the dealer handles groups of such jobs with the bank. Usually the householder, or owner of the structure, sees the bank but once or twice. Sometimes they have no relations with it whatever.

Over a period of ten years, one Chicago bank has made 66,576 property improvement loans under Title I. These loans totaled an aggregate amount of $29,376,166.55; $23,127,588.11 has been repaid. Of this sum $6,041,180.60 is still outstanding, and FHA has paid claims on defaulted notes totaling $207,397.84. This bank attributes its success with Title I insurance to the review to which it subjects every application. The greater part of its Title I volume has been built up on the discounting of dealers' notes.

It suggests that when a lending institution decides to build a Title I volume through contractors and dealers the important steps are identification and interviews. The lender must realize that the important steps in relation to the application for the loan must be carried on by outsiders, not at the bank.

For this reason the bank must establish its own complete confidence in those with whom it does business. The bank suggests that the institution must know a great deal about the contractor or dealer with whom it does Title I business. It must be completely convinced that he is honest beyond any doubt — that the contractor is artisan enough to complete a home improvement to a customer's satisfaction. It points out that if the workmanship is good and the customer feels that he has received full value, there is usually little trouble about the loan.

Records Kept on Dealers

The Chicago bank stresses that the lending institution must be certain that the contractor is financially able to run his own business; that he pays for his materials and is able to meet his payroll promptly. It points out that FHA regulations provide the bank shall "have approved the dealer after such investigation as the insured considers necessary to establish to its satisfaction that the dealer is reliable, financially responsible, and qualified to perform satisfactorily the work to be financed; and to extend proper service to the customer".

The Chicago bank emphasizes that the contractor or dealer who expects to finance his Title I business through the bank should be expected, as a matter of course, to offer the bank his commercial account. Obviously this will enable the bank to keep a close check on his credit and on his transactions. This bank also gets character reports from reliable agencies, mercantile reports and

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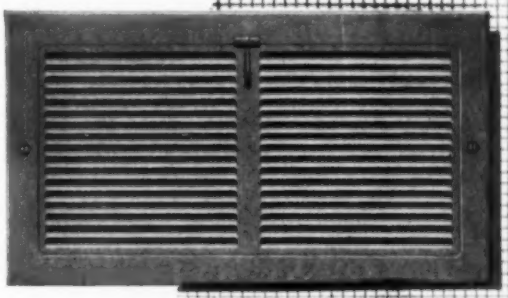

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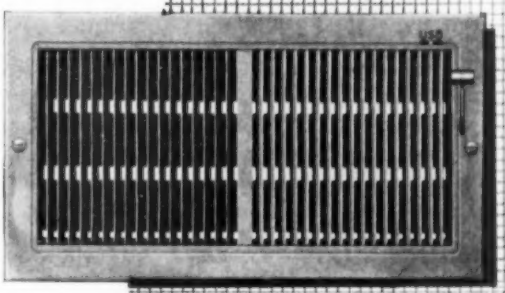

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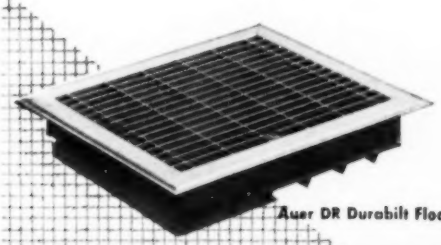

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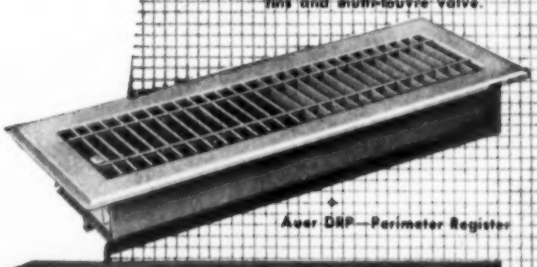

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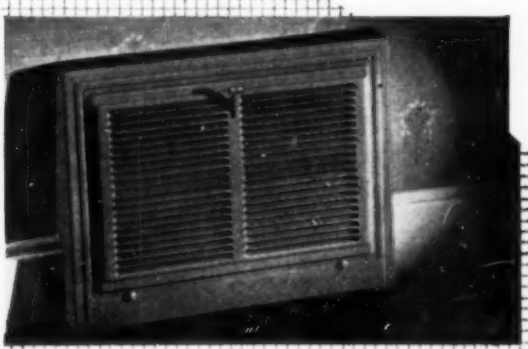

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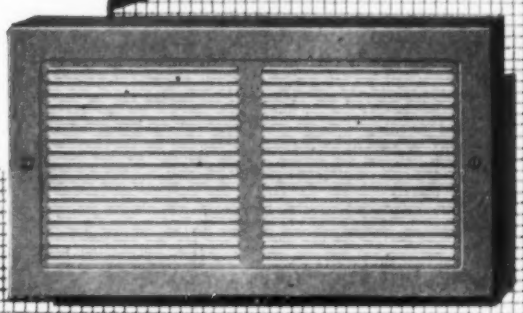

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credit reports. In addition, it makes trade checks, and consults the local Better Business Bureau.

A separate file is kept for each dealer with whom the bank does Title I business. This file contains frequently refreshed data about credit, about his associates, about the sales area of his operation, what he sells his product for, the method of selling, the service guarantee he gives, the names of financial institutions that have financed him in the past, and other items of information.

How to Increase Use of Title I Loans

Over 3000 country banks in the U. S. use the Title I loan insurance for property improvement. One of them, in a Minnesota town of 2000, calls it "installment credit." The banker said that in his town they felt that the Title I facility particularly applied to a contractor and dealer in sheet metal products, as well as others who were selling eligible equipment or materials needed to rehabilitate homes and other structures in the area. This banker invited a representative of the FHA to a dinner to which he also invited the business men of the area whom he thought should be interested.

The man from FHA, in great detail, explained the function of Title I and how it operates; and he distributed various printed material. The meeting was so successful that this banker has held similar dinner meetings each year for the past 17 years. He says that he has always emphasized that the contractors and dealers should have the credit approved before the loan is set up. He told them either to come and see him personally or to telephone if they had any doubt about the credit risk.

The banker has urged the merchants and contractors in his area to launch Title I transactions by following his example — i.e., to call their prospective clients into a meeting, and to discuss with them in detail what they can supply, what it will cost and the various steps that are involved. Several contractors and dealers adopted the suggestion, and made very satisfactory arrangements with those who needed what they had to sell.

Both the banking people and the contractors and dealers of the area have established the custom of addressing meetings of the lunch clubs, commercial clubs, student organizations, the Farm Bureau, etc. At these meetings they have stressed the importance of Title I loans, with the result that there has been a substantial increase in the volume of the business.

Also, in this area, both the bank and the business people advertised the Title I loan possibilities in local newspapers. One year they collectively spent $5300 for this purpose. The bank itself has used display advertising placed in the lobby, and changed at least twice each month. This form of advertising made possible, with the co-operation of the business people, the display of photographs and drawings, suggesting the many kinds of rehabilitation, repairs, or improvements that could

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1. Priced right to sell—in tracts, projects, or mansions.
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PAYNE offers a complete new 1953 line of gravity and forced air designs for closet, attic, floor, wall, basement or crawl space installation.
For descriptive literature—for the name of your local distributor—write
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TO HELP YOU MR. FURNACE MANUFACTURER

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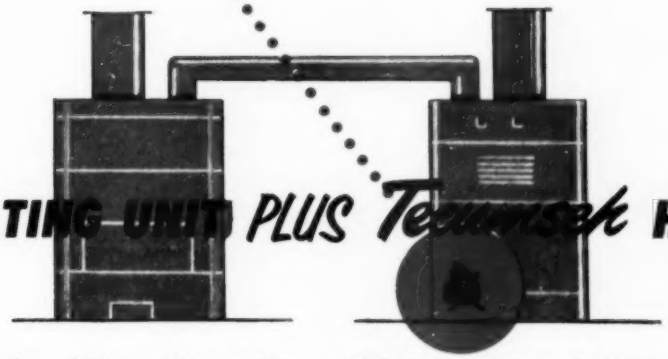

YOUR HEATING-UNIT PLUS Tecumseh HERMETIC

With the introduction of Tecumseh's new line of large hermetics, your engineers can now design a summer air conditioning unit that can be sold as a package unit with your present line of oil or gas fired winter air conditioners.

Designed right and priced right these Tecumseh completely sealed Twin Cylinder Hermetics are available for 1, 1½, 2 and 3 H.P. applications. The Tecumseh hermetic, in a properly designed system, assures you of the most economical and efficient system available.

Economy, freedom from service problems and efficiency are some of the reasons why the Tecumseh Hermetic is incorporated into the majority of room coolers. These same advantages apply to the integral H. P. compressors for year around applications.

Why not get a head start in this new market by offering your dealers a complete . . . heating and cooling . . . air conditioning unit?

Our Tecumseh representative in your territory will be pleased to give you all the facts about these Tecumseh Hermetics, simply write or call us today and he will contact you immediately.

There are over 18 million Tecumseh Compressors in use today—no wonder Tecumseh is the world's largest producer of condensing units for the refrigeration industry.

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• best for you — because Metalbestos is easily and quickly installed. Precision made couplers slip together without forcing . . . are tightly and permanently sealed without using mastic or cement. Adjustable lengths, adjustable elbows and other versatile fittings speed assembly and eliminate wasteful cutting and fitting. Your costs are lower, profits higher, because with Metalbestos you can make more installations per man per day.

• best for your customers — because Metalbestos assures safe, trouble-free venting for the lifetime of the house itself. Double-wall design provides an inner "hot stack" for strong draft, minimum condensation . . . and an air-insulated outer pipe to protect adjacent wall surfaces from dangerous overheating. Permanently tight joints and corrosion-resistant aluminum construction are further reasons why Metalbestos can be installed and then forgotten.

* Extensive research and hundreds of tests with both laboratory and field installations have proved that Metalbestos' insulated, double-wall design and all-metal construction assure safer, more efficient venting than other commonly used types of gas vent pipe.

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be made in a home or in a non-residential structure. The bank found these displays markedly stimulated the business.

FHA Officials Listed

Arthur J. Frentz is assistant commissioner, Title I Div., Federal Housing Administration, Washington, D. C. Leland C. McCallum is the deputy assistant commissioner, Title I Div., and is particularly interested in what is known as the Dealer-Control Unit of FHA, of which James Hobbs is in charge. Mr. Hobbs has developed considerable techniques for promoting Title I loans. Descriptions of these are available to dealers and contractors. In another Washington Letter soon to be issued, other details of Title I loan insurance and its applications will be discussed, with particular attention paid to the contractors and dealers who use it, or who should use it. It is suggested that readers of American Artisan who have questions to ask, or who want more detailed information about any phase of the operation of Title I loan insurance, should communicate with the American Artisan as soon as possible so the information can be supplied in the forthcoming Letter.

As is well known, the FHA is one of the five major parts of the Housing and Home Finance Agency. The President recently nominated Guy T. O. Hollyday, a Baltimore bank president, as the new head of FHA. He succeeds Walter Greene, who is credited with having done an exceedingly good job. The Housing and Home Finance Agency is now headed by Albert M. Cole, until recently a member of Congress from Kansas. The organization he heads includes the Office of the Administrator, Home Loan Bank Board, Federal Housing Administration, Public Housing Administration, and National Housing Council.

The Federal Housing Administration, established in 1934 by the National Housing Act, was created to operate insurance programs. These include mortgage insurance on a long-range program based on long-term value. It also may aid by insuring mortgages in the production of housing. The law likewise enables it to insure the yield, or income, on investment in rental housing for families of moderate income; also, insurance of mortgages for the financing of civilian and military housing at permanent military and Atomic Energy installations.

FHA field offices process applications for authorized construction schedules and related allotments of controlled material needed by builders of privately constructed multi-unit residential structures. The Public Housing Administration is responsible for the administration of the low rent public housing program. The National Housing Council, which includes the HHFA administrator as chairman, and the heads of the three constituent agencies, as well as the heads of the Veterans Administration, Federal Security Agency and the Departments of Agriculture, Commerce, Labor and Defense, has the function of bringing about the fullest use of the Government's housing resources.

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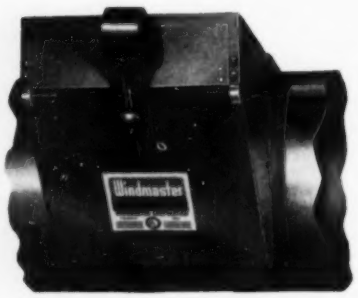

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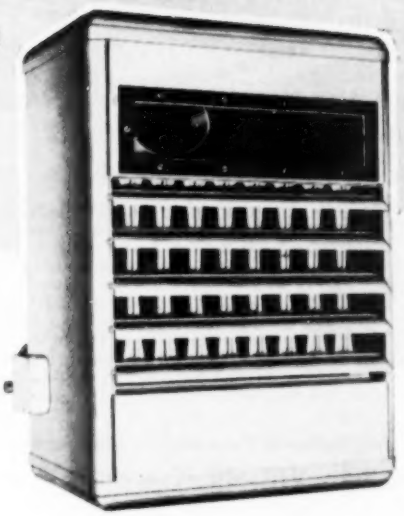

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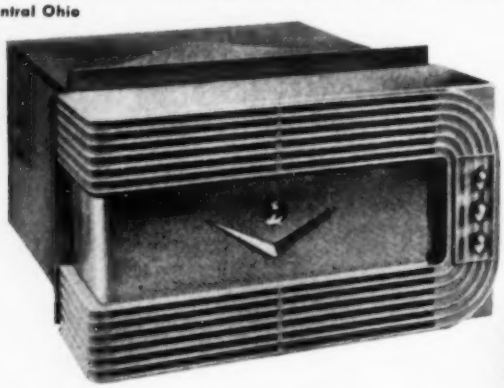

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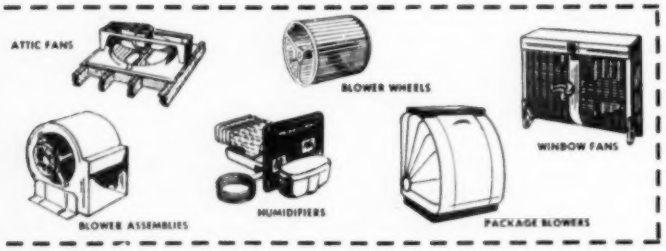

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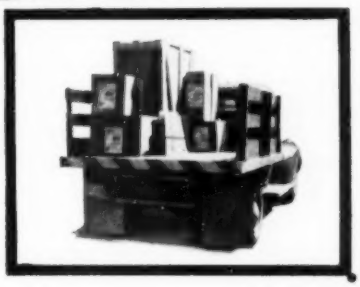

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It's not the great bonanza for furnace dealers, but it sure is the next thing to it. That is, if cutting inventory, labor costs and paper work and handling more jobs means something to you! Here's why the Meyer MARVELLAIRE M-V SYSTEM means greater profit for you:

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All this adds up to a faster turnover for you. And you're not selling the customer short . . . not by a long shot!

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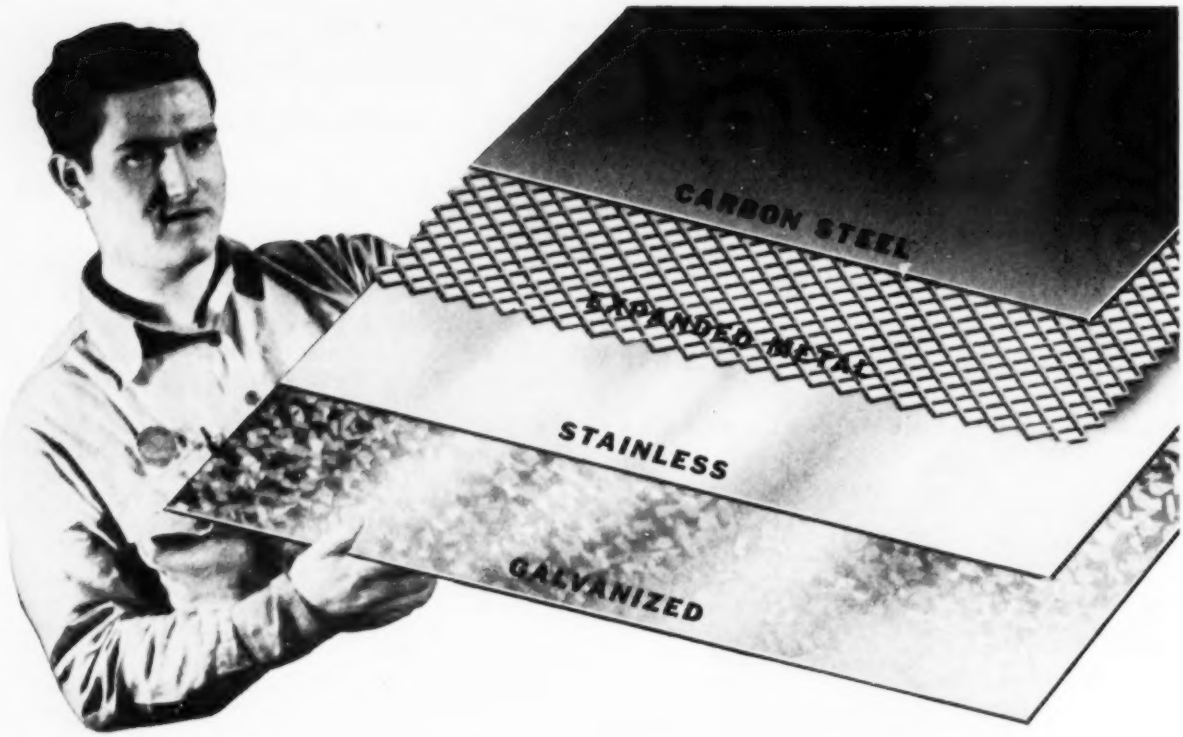

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Getting Set For The Summer Cooling Season

A WARM AIR HEATING DEALER recently said to the editor, "This summer cooling field certainly sounds interesting to me, but I've never had occasion to install this kind of equipment. My salesmen don't know anything about selling it. My installers are willing to learn but don't know what is required of them." This same problem is being faced by a number of dealers embarking on their first season in the cooling field. One solution is to be guided by the policies of warm air dealers who have been doing this kind of work for years.

First, find out what type of market exists in your community. If it is a new house market, the dealer must work with the builder or general contractor, the architect, and the home owner to help create a desire for year 'round conditioning rather than for a heating system alone. If the market is in modernization, steps must be taken to reach those who are in a position to buy summer comfort.

Once the market has been determined, turn to the manufacturer or your heating wholesaler for the selling aids that have been prepared for the dealer. Next, you must train your employees for their role in the selling program. Point out that each person's job is essential in making the business known as a headquarters for residential cooling.

The training of employees often can be best accomplished by holding a series of classes on the subjects related to summer cooling. The fundamental principles of cooling equipment can be explained and the relation between components pointed out. Soon, all employees will be "talking the same language." We know of a dealer who holds a weekly school for his employees. He reads aloud articles appearing in trade publications and then opens the meeting to questions and answers. Frequently, when the time allotted is up, the men stay on because they have become so interested.

No business will succeed without sales, and sales are developed from leads. Every warm air heating dealer has — or should have — a file full of leads. The owner of every existing central warm air heating system is a prospect, especially where installations are five years old or more. The owners of these systems have now reached a point where the first expenses of moving into a new home have been paid off and they are now ideal prospects for summer cooling.

Write the owner a letter describing your residential cooling equipment and how it can be added to his existing heating system. By phone, you can request an appointment and personalize your interest in his family's comfort.

The dealer serving the new house market can develop many leads through builders. He can point out to the prospect (using the blueprint) that the warm air system can also provide air for summer cooling, the cost being absorbed, with little increase, in monthly mortgage payments.

FIG. 1—OUTSIDE AIR is taken into the duct system through a screened grille *(left)*. The air quantity is controlled by the damper being adjusted by the engineer *(right)*. The intake passes through the basement wall above the ground level (see arrow)

Why Modern Furnace Installations Must Have Fresh Air Intakes

Frederick B. Morse, P.E.

Consulting Mechanical Engineer

In relatively new, airtight houses, fresh air intakes are essential in safeguarding against "air starvation." In addition, they are easy to install. The author outlines how certain special air intake problems have been solved, and discusses how much combustion air a furnace actually needs

"WHY SHOULD I put a fresh air intake in a house?" You as a heating contractor should have the answer to that question. If you are putting in a heating system with a fresh air intake, the home owner is likely to ask, "What's this pipe in the closet for?" Or suppose you submit a proposal for the heating systems in a low-cost housing development. The general contractor may never have seen a fresh air intake, and any duct without a grille on the end of it looks like something that can be eliminated. You will have to sell him and the home owner on the merits of a fresh air intake.

How would you justify a fresh air intake to the general contractor to whom you submitted the proposal?

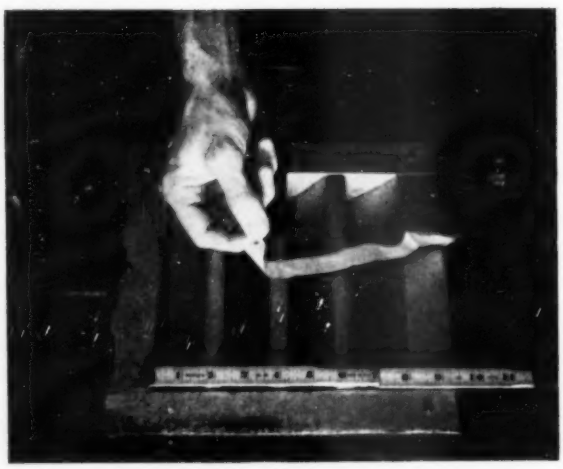

FIG. 2—THE STREAMER is ample evidence that this fresh air intake works. A hole was cut in the floor behind the heater, and an 8 by 8 in. louver dropped in place

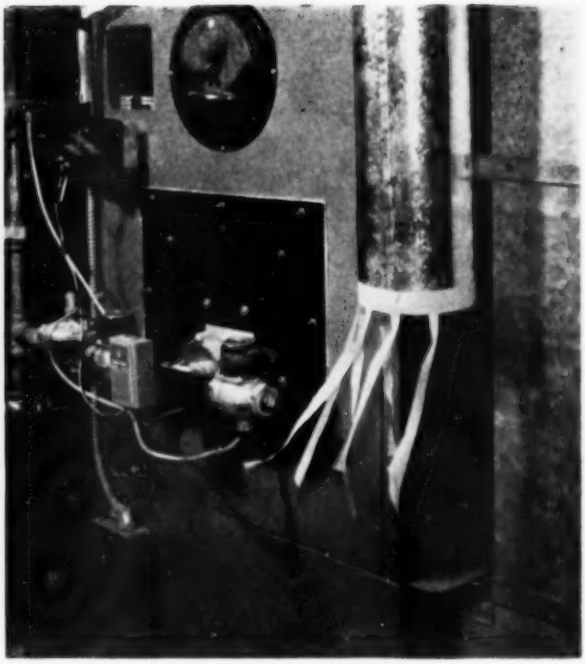

FIG. 3—THE ATTIC END of this fresh air intake *(left)* is fitted with a barometric damper. The bottom end of the pipe stops near the burner *(left)*. Whenever the burner is on, attic air drops down the pipe and the strips of tissue wave briskly

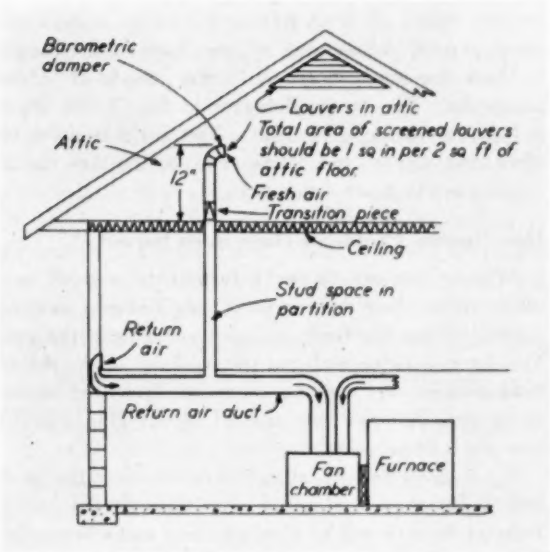

FIG. 4—THE HEATING contractor used a stud space to take fresh air from the attic to a cold air return duct, as he did not wish to cut through the foundation wall

You might take the architectural plans for a house and point out that the aim is to keep it airtight. There are usually no cracks between the joints of the sheathing. Storm sashes and storm doors, if specified throughout the house, will be tightly fitted. Therefore, you may point out, very little air will enter accidentally into the house.

Then you might shift attention to the furnace. For our discussion, we'll assume it is an oil fired furnace, rated at 80,000 Btu per hr output. Whether the furnace is in a basement, a utility room, or a 3 ft by 3 ft closet makes no difference. And the same principles apply, no matter what fuel is used.

You may continue your story by discussing the burner. When it comes on, what happens to the products of combustion? They go up the chimney. But what makes the fire burn? That's simple: there's oil being fed to the burner.

Must Prevent "Air Starvation"

But (and this is your "punch line") that takes air! And where does the air come from? The air must come from the area immediately surrounding the furnace (from the basement, from the utility room, or from the closet). But even all the air in the basement, utility room, or closet won't last long, as the burner must have about 3000 cfh of air, for a five or six room house.

After the burner operates for only a few minutes, you can point out, a sizable amount of air has gone up the chimney. Since the houses which the contractor is going to build will be tight and air will not seep into tiny cracks as fast as it leaves through the chimney, there will be "air starvation."

This means that if the burner can't get enough air, the air pressure inside the house decreases. Incomplete combustion results and carbon monoxide is formed. The longer the burner operates, the lower the air pressure in the house; the lower the air pressure in the house, the more inefficient the burner becomes; the more inefficient the burner, the more carbon monoxide is formed, and so on. The air left in the house has a

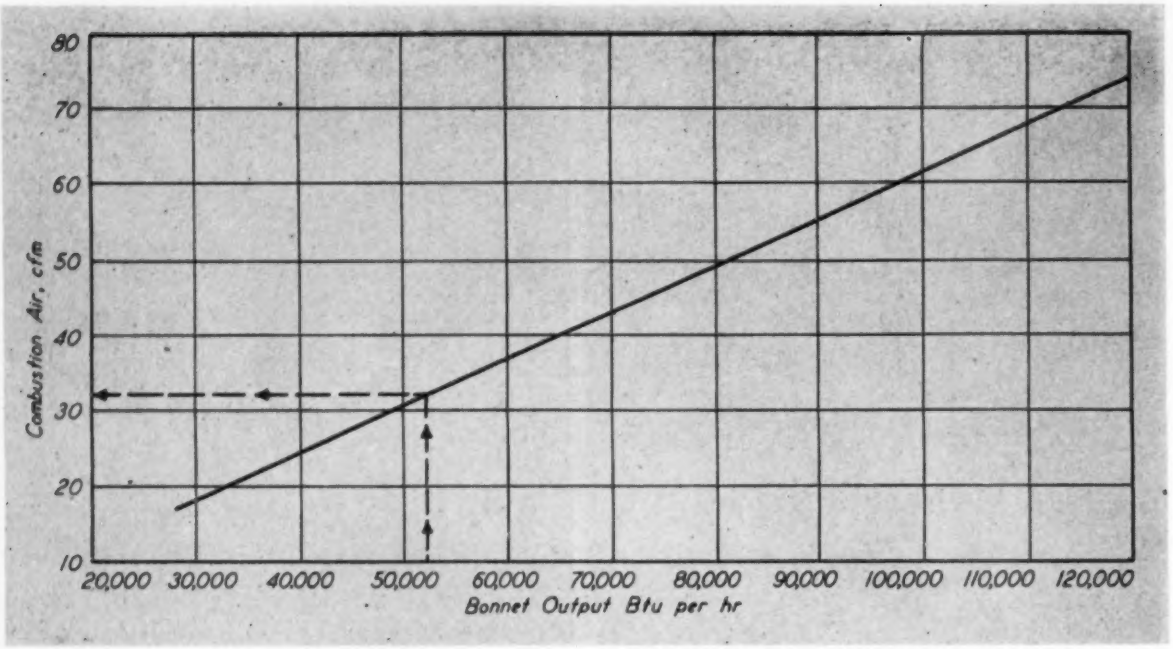

FIG. 5—TO DETERMINE the volume of air required to provide good combustion, the fuel input to the furnace must be known

lower percentage of oxygen. The circle gets tighter and tighter. Soon there won't be enough oxygen in the house to support combustion. The burner goes out. (With a gas-fired furnace, Mother Nature will eventually force some outside air down the chimney. This will spill out the back-draft diverter, but so will carbon dioxide, carbon monoxide and water vapor). If the burner goes out at night when outside doors are closed for long periods, the occupants of the house might not get up the next morning.

Therefore, you may conclude, you propose to put in a fresh air intake of such a size that the burner will always have enough combustion air.

Intakes Easy to Install

Once you have the "go-ahead" from the home owner or contractor, it's easy to put a fresh air intake in a warm air heating system. Let's look at how some heating contractors have installed fresh air intakes.

You can almost see the combustion air coming from the crawl space in Fig. 2. A hole was cut in the floor just behind the heater and an 8 by 8 in. louver dropped in place. These same louvers are commonly used in foundation walls to vent crawl spaces and in side walls to vent shallow attic spaces.

For a gravity warm-air furnace, a cold air return on an outside wall can be used as a fresh air intake. The installer can cut through the sill and connect the register box to the outside.

For a mechanical warm air system with the furnace in the basement, the duct is connected from the outside to the fan chamber on the upstream side of the filters. How a heating contractor did this can be seen in Fig. 1. A barometric damper was put in this fresh air intake to prevent return air from leaving the house. An access door permits adjustment of the barometric damper.

There are several ways to fix the outside of a fresh air intake. The screened louver in Fig. 1 was set in a hole cut through the sill. The fan was operating when this picture was taken and you can see the air tugging at the paper streamer.

How Special Problems Have Been Solved

Suppose you are to put a furnace in a closet or a utility room where there is no outside wall and no crawl space. Then the fresh air must come from the attic. You have to be careful that the fresh air intake doesn't work backwards, carrying warm air from the furnace closet and into the attic instead of bringing attic air into the furnace room.

Fig. 3 shows how a heating contractor solved this problem. He shoved a round pipe through the ceiling. Then on the attic end he fitted an elbow and a barometric damper. The bottom end of the pipe stopped near the burner. Whenever the burner is on, attic air drops down the pipe and the strips of tissue wave briskly.

If round pipe and a barometric damper are not used, a rectangular duct and a standard back-draft louver can be put in. A barometric damper or back-draft louver is good design on any fresh air intake, but one or the other is a "must" on any installation as close to the furnace as the pipe at the right in Fig. 3. Some installers would have wrapped this duct with insulation or boxed it in with rigid insulation board. Perhaps such a refinement is necessary in some cases, but this particular job functions well as you see it here.

In another interesting fresh air intake installation, the heating contractor was reluctant to cut through the foundation wall (8 in. concrete blocks), so he used the stud space of an interior partition as a fresh air intake. As shown in Fig. 4, he connected the bottom of the stud space to a cold air return duct. The top of the stud space was fitted with a rectangular-to-round transition piece, then an elbow followed with a barometric damper.

As you can tell from these illustrations, it's easy to get fresh air to any furnace.

How Much Combustion Air Does a Furnace Need?

However, different amounts of air are theoretically required for the complete combustion of coal, oil, and gas. Since conditions in a combustion chamber are not perfect, to make sure that every droplet of oil and every molecule of gas can find enough oxygen to burn, we always supply an excess amount of air. Now suppose we take the different amounts of air necessary to burn a pound of coal, a gallon of oil, and a cubic foot of natural gas, and find the amount of air necessary to burn each of these fuels based on 1000 Btu input to the burner. The results are surprising. We find that about the same amount of air is necessary to release 1000 Btu for each of these three fuels. The chart in Fig. 5 tells how much combustion air is required for any size furnace.

Just to show how simple it is to use the chart, suppose you are going to install a furnace with an output of 90,000 Btu per hr. Find the output along the bottom; follow this value straight up to the curve. Trace a horizontal line to the left and at the margin read "55 cfm" as the amount of combustion air required.

From Fig. 5 we know how much combustion air is required for a given furnace. Now it is time to actually hang the sheet metal, so you might very well ask, "What size duct should I use?"

Table 1 answers that question. The duct sizes were

Table 1—Duct Sizes for Supply Combustion Air

Output of Furnace in Btu per hr	Duct Size, inches	
	Round	Rectangular
20,000	3	3 x 3
35,000	4	3 x 5
56,000	5	3 x 8
80,000	6	3 x 12
108,000	7	4 x 11
140,000	8	4 x 16
185,000	9	5 x 14

calculated on the basis of the entrance to a fresh air intake being covered with 16 mesh hardware cloth. A duct velocity of 500 fpm was assumed. If the output of a furnace falls between two lines in the first column, you can't go wrong by using the next larger size. For example, if you are putting in a furnace with an output of 60,000 Btu per hr, use a 6 in. round pipe.

Fresh Air Essential

Fresh air intakes are important. In fact, fresh air is essential for any kind of a fire anyplace. In addition, the human body doesn't operate without fresh air. On the front page of a big-city paper, recently, was a story about the police padlocking a building because three men inside had collapsed. An investigator from the fire department said the three men collapsed from lack of oxygen. And two men had died there 18 days before! Those men probably would not have died if the burner had had a fresh air intake.

I know of a heating contractor who has built a reputation for always putting in a fresh air intake. On one occasion he gave a home owner a price for a conversion burner. The house was only a few years old and was practically airtight. It so happened that another contractor had quoted the same price but had not included a fresh air intake. The home owner apparently wanted a lower price installation, and questioned the fresh air intake. The contractor explained why a fresh air intake was essential and exactly how it would be installed. Then the home owner asked, "What's your price without a fresh air intake?"

This is the answer he got. "Mister, I've got a conscience. It would bother me if I put in your job without a fresh air intake. I don't have a price without a fresh air intake!"

ASHVE GUIDE FOR '53 NOW AVAILABLE

THE 1953 EDITION of the *Heating, Ventilating and Air Conditioning Guide* contains 51 chapters, grouped in seven sections, and covering such topics as fundamentals, human reactions, heating and cooling loads, combustion and consumption of fuels, systems and equipment, special systems, and instruments and codes.

New information on warm air system design and unit heaters is included, and a chapter on water vapor and condensation in building construction has been added. Improvements in warm air gravity and forced circulation systems are described in the chapters on warm air systems. Heat losses from floor slabs and perimeter heating systems are covered (with new material) in the chapter on heating load. Simplified cooling load calculations are included and an enlarged list of codes and standards pertaining to heating, ventilating and air conditioning is given.

Copies are priced at $7.50. They may be obtained from the American Society of Heating and Ventilating Engineers, 62 Worth St., New York 13.

HOW INSULATION SAVES FUEL

POSSIBILITIES OF SAVING more than 40 per cent of heating fuel in the average house through fully insulating it are described in *Housing Research No. 5*, the current issue of the quarterly in which the Housing and Home Finance Agency makes available the findings of its research program. The publication is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 40 cents.

"Don't 'Guesstimate' Cooling Loads"

The contractor selecting cooling equipment for a home cannot safely use shortcut methods, says the author. He offers an estimating form intended to take the guesswork out of peak load calculation

H. C. Pierce
Air Conditioning Div.
Servel, Inc.

THE DESIGNER must use exact methods in determining the cooling load of a residence, which is somewhat different in character from the cooling load of a commercial structure. Design factors should be derived from the latest data published in the ASHVE Guide, in order to insure accurate load analysis and therefore proper equipment selection.

It is not sufficiently accurate to use shortcut methods based, for example, upon house volume. A house of given size is subject to wide variations in cooling load, dependent upon important factors such as areas of sun-exposed surfaces, type of window shading, roof and wall insulation, house orientation, etc. Houses having maximum cooling loads of 3 tons can vary as to net inside volume from 9000 to 18,000 cu ft. Houses having 5 ton cooling loads can vary in net volume from 15,000 to 30,000 cu ft.

In addition, it is not accurate enough to use "average" heat transfer factors for the many different types of wall and roof construction.

Cooling load calculations for residences are slightly more complicated than heating load calculations because there are more factors to be considered. Because of the variable nature of some of the contributing load components, and because they do not necessarily impose their maximum effect simultaneously, care must be exercised in determining their phase relationship so that equipment of proper capacity may be selected to maintain specified indoor conditions.

Evaluating Load Components

A cooling load determination is composed of six main components of heat gain. It is necessary to segregate and evaluate the amounts of dry heat (*sensible heat*) and moisture load (*latent heat*) for each of these several components. A general classification of all sources of heat gain includes:

	Sensible Heat	Latent Heat
External Loads		
a) Normal Transmission	Yes	None
b) Sun Heat	Yes	None
Internal Loads		
a) People	Yes	Yes
b) Lights	Yes	None
c) Appliances	Yes	Yes (in most cases)
Outside Air Load	Yes	Yes (in most cases)

All of the above load components are evaluated in terms of Btu per hr. The sum of the sensible heat and latent heat loads is the *total heat load*, which, divided by 12,000, is equal to the *tons of refrigeration* capacity required.

In order to maintain the specified indoor conditions as to dry bulb temperature and relative humidity it is necessary to select an air conditioning unit that has a sensible heat capacity equal to or greater than the calculated sensible heat load. In addition the unit should also have a latent heat capacity equal to or greater than the calculated latent heat load.

It is not sufficient that the total capacity of the unit equal the total cooling load. For example, under-capacity on sensible heat and over-capacity on latent heat are not compensating. Such circumstances would mean that the dry bulb temperature in the space would be above that which is specified, and the room air moisture content or relative humidity would be less.

How Load Characteristics Vary

Different types of jobs will vary as to the relative amounts of sensible and latent heat. The character of a particular cooling load can best be described by stating the ratio of the latent heat load to the total heat load in percentage. For example, a residence usually has a latent load which is about 10 to 20 per cent of its total heat load. However, commercial establishments will have cooling loads with a ratio of LH/TH of 20 to 30 per cent. Higher latent ratios exist in restaurants, night clubs, and theaters, which will have from 25 to 45 per cent LH/TH. It is obvious that the character of the load will vary depending upon the in-

Design Temperatures	Summer		Winter
	Dry Bulb	Wet Bulb	Dry Bulb
Outside	F	F	F
Inside	F	F	F
Temp. Difference	F Cooler		F Warmer

Engineered by.....

Date.....

EXTERNAL LOADS											SUMMARY OF LOADS					
Item No.	Surface	Area	Code No.	Type of Const.	Hourly Summer Load Analysis (Sun Load Combined with Net Transmission Load at 15°T_d)						Summer				Winter	
					AM PM		AM PM		AM PM		Sensible		Latent			
					Factor	(B x E) Btu	Factor	(B x G) Btu	Factor	(B x J) Btu	Factor	Btu	Factor	Btu	Factor	Btu
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
1	Glass N-NE															
2	Glass E-SE															
3	Glass S-SW															
4	Glass W-NW															
5	Wall N-NE															
6	Wall E-SE															
7	Wall S-SW															
8	Wall W-NW															
9	Roof															
10	Insert Max. Load in Col. M															
11	Ceiling															
12	Floor															
13	Partition															
INTERNAL LOADS																
14	People	No. of People			x Col. L & Col. N											
15	Lights	Watts			x Col. L						3.4					
16	Appliances															
17	Motors	H.P.			x Col. L											
OUTSIDE AIR LOAD																
18	Ventilation Requirements	cfh														
19	Infiltration	cfh			..... cfh Use largest amount.											
20	Exhaust Fan Capacity	cfh														
ADDITIONAL LOADS (When Design T_d is Greater Than 15°)																
21	Total Glass Area	sq ft x Col. L														
22	Total Wall Area	sq ft x Col. L														
23	Total Roof Area	sq ft x Col. L														
SUMMARY OF COOLING AND HEATING LOADS																
24	Grand Totals															
25	Allowance for Pick-up & Duct Loss (Usually 15%)															
26	Total Heating Load															
27	Total Cooling Load (Item 24 Col. M + Col. P)													Btu/hr		
28	Total Tons Refrigeration Load (Item 27 ÷ 12000)													Tons		
29	Ratio of Latent Heat to Total Heat													% LH/TH		

EQUIPMENT SELECTION AND SPECIFICATIONS			Single Unit Performance	Multiple Unit Performance
30	Air Conditioner Model No. (s)			No. of Units
31	Source of Cooling Water			
32	Cooling Cycle Performance at.....F Cooling Water	Total Air Supply Quantity	cfm	cfm
33		Outside Air Quantity At.....DB&.....WB	cfm	cfm
34		Return Air Quantity At.....DB&.....WB	cfm	cfm
35		Inlet Air Mixture Temperature	.....DB and.....WB	
36		Sensible Heat Capacity	Btu	Btu
37		Latent Heat Capacity	Btu	Btu
38		Total Heat Capacity	Btu	Btu
39		Tons of Refrigeration Capacity	Tons	Tons
40		Ratio LH/TH	%	%
41	Heating Cycle Performance	Capacity	Btu	Btu
42		Total Supply Air Quantity	cfm	cfm
43	Gas or Steam Input Req.	Summer	Btu	Btu
44		Winter	Btu	Btu

FIG. 1 — THIS COOLING AND HEATING load estimating form provides space for calculating peak cooling loads over a period of several hours

tensity of moisture-producing sources, such as people, outside air and appliances, but it is important that each be carefully evaluated in order to properly interpret equipment requirements.

Another general observation of interest is the difference in importance between certain load components in a residential cooling load as compared to a commercial load. Typical residential design calculations reveal that approximately 80 per cent of total sensible heat load results from the external loads and only 20 per cent from internal loads and outside air load. This is logical, because the structure is exposed to heat gain through all four walls and the roof. By comparison, the internal loads are of lesser intensity. Most commercial establishments present the reverse in relative importance. Frequently the building is exposed to outdoor temperature and sun heat on one side only. The internal load, by virtue of concentrated occupancy, the requirement for increased ventilation, artificial illumination, appliances, etc., becomes of major importance. Thus, the external loads may be only 20 per cent and the internal loads and outside air load will be 80 per cent of the total sensible heat load.

Therefore, it is extremely important that exact methods be employed in determining the external loads on a residential type of structure. Sufficient accuracy in

SURVEY

Surveyed by _____ Date of Survey _____

1. Type of job _____ 2. New _____ Existing _____ 3. Direction building faces _____
4. Areas to be conditioned _____
5. Desired Inside Temperatures: Summer _____ Winter _____
6. Glass: Single _____ Double _____ Type Shading _____
7. Wall Construction and Color _____
8. Roof Construction _____
9. Ceiling Construction _____ T_d* Summer _____ T_d Winter _____
10. Floor Construction _____ T_d Summer _____ T_d Winter _____
11. Partition Construction _____ T_d Summer _____ T_d Winter _____
12. _____
13a. No. of People (Residential Application) _____
13b. Tabulate the following for Commercial Type Applications:

Internal Loads	Room No. 1	Room No. 2	Room No. 3	Room No. 4	Room No. 5	Room No. 6	Totals
No. of People							
Lights							
Appliances							

14. Cooling water: Source _____ Temperature _____ Is supply ample? _____
15. Are entrance openings ample for handling equipment? _____
16. Remarks: (Regarding existing heating system and capacity — Sources of unusual loads and special inside design temperatures, etc.)

Note: If a complete system layout is to be made a sketch or architectural drawings should accompany this survey and should include the following information. (Use the following as a check list.)

1. Location and size of all windows ☐
2. Acceptable location for air conditioning unit ☐
3. Acceptable location for cooling tower ☐
4. Location of flue ☐
5. Location of electric service ☐
6. Location of gas service ☐
7. Location of water service ☐
8. Location of floor drains and sewer connection ☐
9. Layout and sizes of all existing duct work ☐
10. Location and sizes of all existing grilles and registers, stating whether outlets are in floor, baseboard, or in high sidewall ☐
11. Location and height of trees or adjoining buildings which might shade this structure ☐
12. Ceiling heights ☐
13. Direction building faces ☐

*Temperature difference

FIG. 2 — DATA ON DESIGN CONDITIONS can be recorded on this survey form as a preliminary step to using the estimating form of Fig. 1

the overall calculated total load on a commercial type of job can be maintained by employing average factors or shortcut methods in arriving at an estimate of the external loads, because such inaccuracies will not influence the total load to a major degree. Many textbooks and application engineering manuals demonstrate methods of calculating cooling loads that fall into the latter category, but such data and methods are not sufficiently accurate for residential work.

Calculating the Peak Load

The cooling load for practically every structure will vary in intensity hour by hour throughout the day, principally because of the rotating sun load and outdoor temperature changes. It is practically impossible to judge, without analysis, when the peak load will occur. A residence which is exposed on all four sides will usually have its peak load in the afternoon. If the residence is rectangular in shape and the long dimension faces south, the peak load will be early or mid-afternoon. If the same structure were facing west the peak load would be later in the afternoon and would probably be greater because glass and wall areas facing west receive more heat than surfaces facing south.

To eliminate the judgment factor in guessing when the peak load will occur, the *Hourly Summer Load Analysis* section of the cooling and heating load estimating form shown in Fig. 1 provides space for the calculating of cooling loads over a period of several hours. Three *time of day* columns are provided to facilitate the analysis of the important heat gains through glass, walls and roof.

Load analysis for all residential type jobs can be made by calculating the loads at 2 p.m., 4 p.m. and 6 p.m.; and these numbers will be inserted in the column headings with *a.m.* crossed off the form in each instance. The maximum hourly load will be apparent on line 20 when the totals of columns F, H and K are inspected. The largest amount will be repeated in column M for summary purposes.

Kitchen Presents Special Problem

The kitchen of a residence presents a special cooling problem. Experience has proven that practically every family wants approximately the same degree of cooling and therefore comfort conditions in the kitchen as compared to other parts of the house. Higher capacity cooling equipment would be needed when the heat output (sensible plus latent) of the kitchen appliances is at its maximum — if this period were not so brief. However, since it is, there are other ways in which the maximum load can be handled during this period.

In commercial establishments, where appliance loads are more or less continuous, the added heat gain must be taken into account when calculating the tonnage required for cooling. If these appliance loads were taken into consideration in arriving at the total tonnage for a residential application, the customer would be penalized by buying added equipment to handle a load that exists for not more than an hour or two each day. Because of this, it is conventional practice to ignore appliance loads in residential type applications and recommend the installation of a kitchen exhaust fan to be used during the cooking periods. The appliance load usually occurs in a home at around five to seven and at this time some of the larger external loads have diminished, leaving more equipment capacity to handle some of the appliance load.

A kitchen exhaust fan *should* be installed in a residence. This fan should not handle more than 300 or 400 cfm. At this capacity it will be found that the kitchen odors will be confined to the kitchen space and good appliance heat removal will be achieved. When more than 400 cfm is handled, the whole air conditioning system will be penalized because more hot outside air will be brought in, thus increasing the cooling load unnecessarily. Of course the temperature in the kitchen will increase several degrees when the stove is in operation. However, if the air handling system is adjusted to provide 3 to 5 deg lower temperature in the kitchen, without appliance load, the temperature under peak load conditions will seldom exceed the temperature in other rooms — providing the exhaust fan is properly used. A good practice recommendation is to install two 14x3¼ in. risers to serve the kitchen. This will permit on-the-job adjustments to meet the above requirements. Normally, the second riser is turned off during the heating season; a lesser air quantity is sufficient to heat this space.

Cooling Load Often Less Than Design Load

Many engineers have contended that the actual cooling load on a house is somewhat less than the calculated maximum load. Experience has indicated that the design load factors contain a "hidden" factor of safety which permits undersizing of equipment to some extent. It appears that a house that is being cooled to a constant temperature 24 hours per day has a storage of "refrigeration effect" in the structure itself, the furniture and all other contents, to the extent that the peak cooling load has been levelled or reduced somewhat. This situation has been termed "flywheel effect."

On-the-job observations have indicated that the actual cooling load, on certain houses, is as much as 15 or 20 per cent less than the design load. It is also observed that the percentage difference between actual and design loads varies as a result of one or more of the following factors:

1. Masonry *vs.* frame construction
2. Insulated *vs.* uninsulated walls
3. Maximum wall and glass exposure, south *vs.* west
4. Difference between night temperatures and maximum day temperatures

Unfortunately, sufficient field studies have not been made to properly and accurately evaluate flywheel effect for all of the different types of structures. Until such time as authentic data has been established, it is well for the application engineer to select cooling equipment having a capacity equal to or very close to the calculated load.

[Cooling and heating load estimating form courtesy Servel, Inc.]

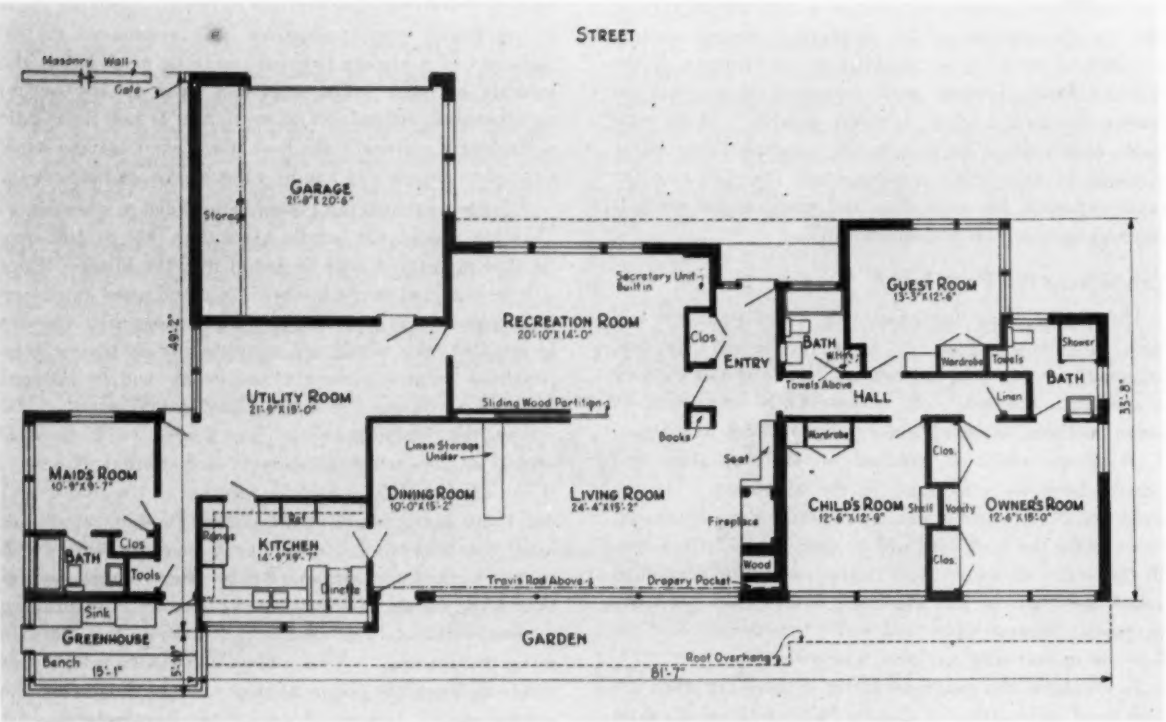

FIG. 1—FLOOR PLAN of ranch-type home (utilizing the solar orientation principle) in which complete panel-convection system was installed

Complete Convection-Panel System—Another Step Forward

In this installation, all of the air which provided the floor panel heating effect was admitted into the rooms. In spite of large glass areas and ventilation requirements, the design heat loss was only 45 Btu per hr per sq ft of floor surface

R. W. Roose and S. Konzo
University of Illinois

IN EARLIER articles of this series, the distinct trend towards the placement of heat ducts in the floor slab was observed. The closed circuit type of warm-air floor panel system was found to give essentially the same results as the hot-water floor panel system. In fact there were no technical advantages to be gained by the use of a closed-circuit warm-air panel system, and some economic disadvantages. The opening up of the closed-panel system to provide a panel-convection type of heating marked a distinct departure from the prevailing trend. Initially, only a portion of the entire circulating air was introduced into the room and the remainder was returned through subfloor ducts.

The installation described in this issue is one of the early attempts toward a complete panel-convection system. Though the installation was a "deluxe" system, installed in an expensive home, much can be learned by a study of the basic principles involved which can be applicable to low-cost structures.

FIG. 2—A CLOSED subfloor plenum having a special floor construction of steel building panels was used

One of the installations in which actual performance data was made available was the ranch-type residence built by Howard M. Sloan in Glenview, Illinois. The home was of a basementless construction in which the solar orientation principle was incorporated. The floor plan is shown in Fig. 1. The design heat loss of the house at an indoor-outdoor temperature difference of 80 F was about 94,000 Btu per hr of which 26,000 Btu per hr comprised the ventilation loss. The total floor area of the heated space was about 2100 sq ft and the cubic contents were about 17,850 ft.

The house was built with a closed subfloor plenum utilizing a special floor construction consisting of steel building panels, as shown in Fig. 2. These panels were 16 in. wide and 7½ in. deep and were covered with a thin layer of sheet steel. A layer of ½ in. of "Floorcrete" (a commercial product consisting essentially of magnesium and oxy-chloride) served as the finished floor. The floors in the various rooms of the house were covered with rugs, wall-to-wall carpeting, asphalt tile, etc.

All Warm Air Discharged to Room

The heating system was of the panel-convection type in which all of the air that served to heat the floor panels was eventually discharged into the rooms before being returned to the furnace. The warm air from the furnace was discharged under the floor into ducts extending the entire length of the house and then discharged from the trunk duct at a number of outlets, as shown in Fig. 3. The warm air traveled through the subfloor space provided by the steel floor panels. This space was equivalent to an air space of 16½ in. deep, and consisted of the 7½ in. depth of the panel and the 9 in. depth of the plenum. The partition walls extended downwards to the foundation, as shown in Fig. 4, to provide seven distinct zones. A separate trunk duct supplied warm air to each of these zones, so that separate control of the air flow would be maintained. As can be seen from the detail of the floor section, Fig. 5, the house was not strictly of a slab-floor construction, but was of

Test data from the Sloan House was gathered and reported in "Steel Floor Warm Air Panel," by John E. Peterson, *American Artisan*, June 1947, and a similar article by the Editor, *American Builder*, April, 1947. Acknowledgment is made to H. C. Pierce, Servel, Inc., Evansville, Indiana, and John E. Peterson, formerly of Minneapolis-Honeywell Regulator Co., for supplying the test data taken in February 1947. Information on the construction features of the house was supplied by L. E. Miller, Fenestra Building Panel Div., Detroit Steel Products Co., Buffalo, N.Y.

How We Got Where We Are In WARM AIR PERIMETER HEATING

the *fifth* in a series planned to tell about:

- **Investigations in the Research Residences at the University of Illinois**
- **Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)**
- **Specific phases of warm air heating**

. . . in articles so far:

- **heating basementless homes**
- **warm air ceiling panels**
- **heating slab floor homes with ceiling and floor panel systems**
- **floor panel-convection heating for slab floor homes — partially open and completely open**

. . . in articles to come:

- **survey of field practices**
- **early practices in perimeter heating . .**
- **new research residence built**
- **comparison of two-loop perimeter and three convection systems**
- **comparison of perimeter loop and two-loop system**
- **perimeter laboratory studies**
- **crawl space heating**
- **8 in. loop system vs. 6 in. loop system**
- **loop vs. radial system**

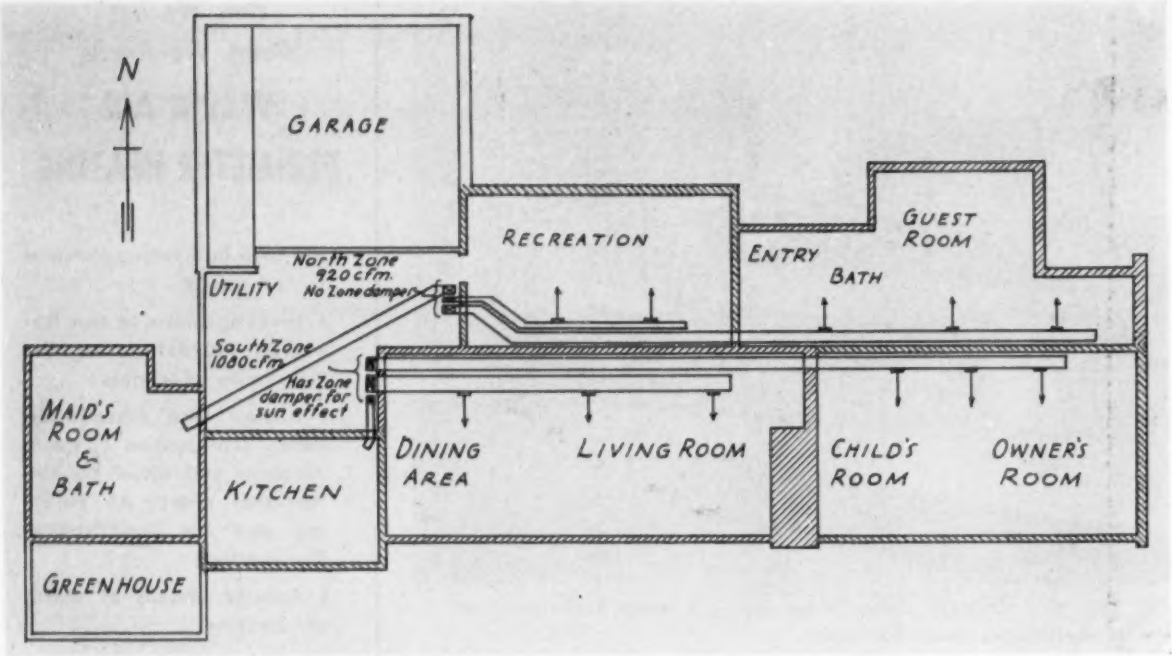

FIG. 3—WARM AIR from the furnace was discharged under the floor into ducts extending the entire length of the house, then discharged from the trunk duct at a number of outlets

a modified crawl-space floor construction.

For the purpose of minimizing the heat transfer to the ground and moisture travel from the ground, excellent precautions were taken to provide a good subfloor. The ground was first covered with heavy layer of asphaltum; a 4 in. layer of cinders was then applied; then a 3 in. slab of vermiculite insulating concrete (6 to 1 mix) was poured on top; this in turn was topped with a moisture barrier consisting of heavy paper mopped with asphalt. The subfloor details are shown in Fig. 5.

The warm air which was admitted into the subfloor plenum was directed towards the outside walls and into an air space within the studding spaces. The air entered the room either through a narrow baseboard register, or in some cases through a slot in the window sill. For the purpose of minimizing the heat transfer from the studding space to the outdoors, the spaces were insulated with a 2 in. blanket type insulation provided with a reflective surface on the warm air side. An air space of 1⅝ in. depth was provided in the studding space for air circulation.

The air entering the rooms followed the path indicated by the arrows in Fig. 4, and entered the return-air intakes near the ceiling at the center of the house. Thus, all of the air which provided the floor panel heating effect was admitted into the rooms, in contrast with the systems previously described in which part or all of the air was returned to the furnace through subfloor ducts. The warm air introduced below the large glass exposures was intended to counteract the cool air dropping off the cool glass surfaces. The location of the return-

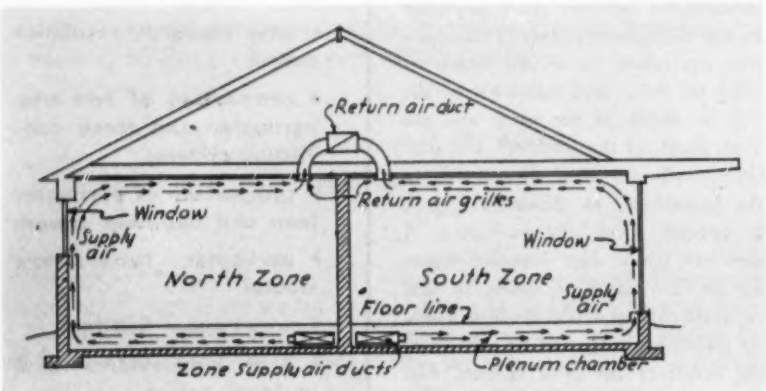

FIG. 4—PATH OF AIR CIRCULATION. Partition walls extended down to the foundation provide seven distinct zones

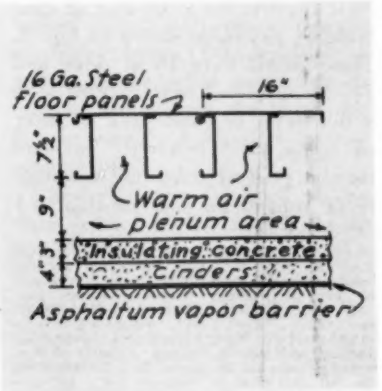

FIG. 5—SUBFLOOR DETAILS show dimensions for panel construction

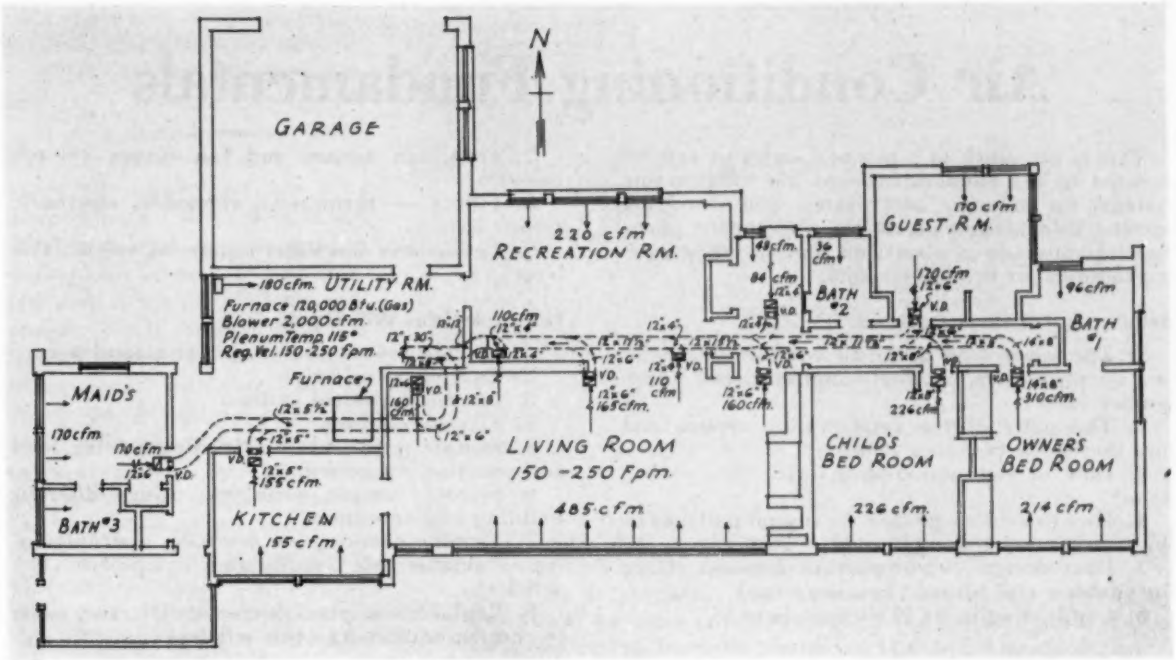

FIG. 6—LOCATION OF RETURN-AIR intakes and the arrangement of the return-duct system in the attic space are shown

air intakes and the arrangement of the return-duct system in the attic space are shown in Fig. 6.

Good Results Obtained

The total air-flow rate was about 2000 cfm, which is exceedingly large for a design heat loss of 94,000 Btu per hr. Of the total flow rate, about 300 cfm was outdoor air which was introduced into the return-air duct system, for year 'round controlled ventilation. This ventilation rate corresponded to a positive supply of one air change of fresh air per hour.

The necessity of providing for a year 'round ventilation supply becomes apparent when it is realized that most of the windows were of the fixed sash type. The discharge air velocities through the register openings under the windows were found to be between 150 fpm and 250 fpm, which should be sufficient to counteract the cool air stream from the window surfaces. The velocity of air movement within the occupied zones of the rooms was less than 50 fpm, considered negligible.

A summary of room-air temperatures observed on Feb. 6, 1947, when the outdoor air temperature varied from 9.5 F to 17 F, is presented in Table 1. At four locations in the living room and recreation room, air temperatures were observed at three levels: namely, 1 ft below the ceiling, 5 ft above the floor, and 1 ft above the floor. When the outdoor air temperature was about 9.5 F, the average temperature difference from floor to breathing level was less than 1.0 F. The average floor-surface temperature at the same time was of the order of 76 F, which was satisfactory and well below the accepted maximum value of 85 F. In this connection it should be observed that in spite of the large glass areas and the large ventilation requirement, the design heat loss amounted to only 45 Btu per hr per sq ft of floor surface, which is well below the maximum permissible rate specified for FHA approval for the locality.

(*Please turn to page 119*)

Table 1—Room-Air Temperatures Observed on Feb. 6, 1947

Outside Temp. F	Time p.m.	Living Room — 6 in. from South Window			Recreation Room — 6 in. from North Wall			Recreation Room — 5 ft. from North Wall			Recreation Room — 4 ft. from Center Wall		
		1 ft below ceiling	5 ft above floor	1 ft above floor	5 in. below ceiling	5 ft above floor	5 in. above floor	1 ft below ceiling	5 ft above floor	1 ft above floor	1 ft below ceiling	5 ft above floor	1 ft above floor
14	12:25	77	Sun 78.5	Sun 80	75	74	72						
17	2:50	79.5	Sun 82	Sun 84									
16.5	3:55	74	74	74	73	73	70						
	5:00	72	71	71	72	71	70						
9.5	10:40	73.5	73.8	73.5	71	71	69	72	72	71	73	72.5	72.5

Air Conditioning Fundamentals

This is the ninth in a planned series of articles devoted to the fundamentals of air conditioning systems for summer and winter, and providing specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

Articles So Far Have Covered:

1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September issue)
2. The parts of the refrigeration system and how they work (October issue)
3. How to estimate cooling loads (November issue)
4. How to achieve proper air stream patterns in the conditioned space (December issue)
5. Duct design — comparison between sizing for summer and winter (January issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (March issue)
8. Filters — throwaway, cleanable, electronic (April issue)
9. Condensers and water regulating valves (this issue)

Future Articles Will Treat:

1. Cooling towers and evaporative condensers
2. Equipment selection
3. Electrical control systems
4. Electric controls
5. Sample problem — estimating cooling load and selecting equipment
6. Second sample problem, using different building and conditions
7. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
8. Replacement procedures for defective parts in cooling equipment (two articles)

How Condensers Work

Anyone dealing with mechanical cooling systems should know the origins of the heat which the condenser must remove from the system, and should have a working knowledge of the various types of condensers. Here described are the air cooled and water cooled condenser, along with the water regulating valve used to control the flow of condenser water

AIR CONDITIONING is not simply a matter of blowing cool air into a warm space. Rather, it is a process wherein a moving stream of air, in recirculating, absorbs heat at one point in its path and gives up heat at another. The air takes up heat as it passes through the conditioned space and gives up heat as it passes through the cooling coil in the air conditioner. The process begins with a transfer of heat to the air stream, is followed by a second transfer of heat to the refrigerant inside the cooling coil, and is concluded by a third transfer of heat from the refrigerant to a heat sink (a heat sink is the opposite of a heat source). This article and the next will be devoted to an examination of the third heat transfer process and some of the equipment used to accomplish it.

In a previous article of this series (American Artisan, February 1953) the subject of condensing units was discussed at some length. It was shown how the function of the various components of a mechanical cooling system are related to each other. It was explained that the evaporator is the coil where liquid refrigerant under relatively low pressure is made to boil off into vapor by absorbing heat from air. It was also explained that the condenser is the coil where vapor refrigerant under relatively high pressure (having been increased in pressure by the compressor) is made to condense to liquid by removing heat from it with a cooling medium such as outside air or water.

How Law of Energy Conservation Applies

In considering the operation of a mechanical cooling system, it is convenient to recall a very fundamental physical law known as the *Law of the Conservation of Energy*. This principle states that energy may neither be created nor destroyed, but is merely changed in form. In a system of energy transfer (heat being one form of energy) such as a mechanical cooling system, this law tells us that when the system has "balanced out" (run long enough for pressures and temperatures to be-

come stable), the sum of all energies entering the system must equal the sum of all energies leaving the system.

In a mechanical cooling system there are two points where energy enters the system and one point where it leaves. In the form of heat it enters through the evaporator or cooling coil; in the form of mechanical work it enters through the compressor; and in the form of heat it leaves through the condenser. Fig. 1, a diagrammatic representation of this, shows that, in accordance with the conservation law, the heat thrown off by the condenser is equal to the heat absorbed by the evaporator plus the heat equivalent of the energy put into the system by the compressor. (This is theoretically true. In an actual system there are certain minor unavoidable heat gains and losses that cause variations from theory).

Fig. 2 should bring the picture into a little sharper focus. Readers of this series will recognize this as a pressure-heat content diagram similar to those discussed in the February article. New readers should have no difficulty in understanding it if they will think of it simply as a picture of the refrigerant inside of a mechanical cooling system at various points in the system. If we could concentrate our attention on a certain particle of refrigerant, "Freon-12" for example, as it moves throughout a cooling system, we might (depending upon the design of the system and the operating temperatures) find the following conditions:

Point	Location	Pressure (Psig)	Heat Content (Btu per lb)
A	Entering Evaporator	36.98	31.2
B	Entering Compressor	36.98	84.2
C	Entering Condenser	116.9	91.5
D	Leaving Condenser	116.9	31.2

Every pound of refrigerant moving through the evaporator coil will absorb (in our simplified example) heat in the amount of B − A or 53.0 Btu. The compressor, in raising the pressure, will increase the heat value of the refrigerant in the amount of C − B or 7.3 Btu. Since the heat to be removed by the condenser is represented on Fig. 2 by C − D or 60.3 Btu, it should be quite obvious that this value is neither more nor less than the sum of the heat put into the system between A and B and between B and C by the evaporator and compressor respectively.

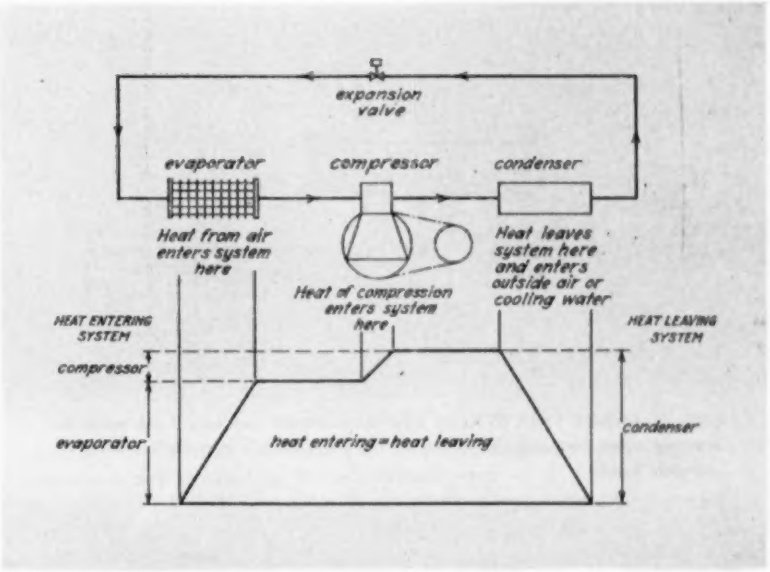

FIG. 1—IN ACCORDANCE with the laws of thermodynamics, the heat thrown off by the condenser in a mechanical cooling system is equal to the heat absorbed by the evaporator plus the heat equivalent of the energy put into the system by the compressor

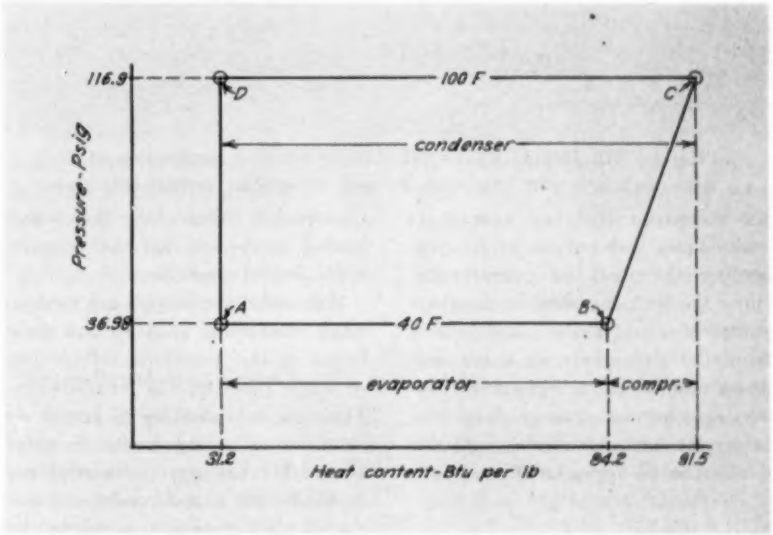

FIG. 2—A PARTICLE OF "Freon-12" refrigerant, moving through a cooling system, undergoes pressure and heat content changes, as shown, at various points in the system. The conditions vary with the system's design and the operating temperatures

The temperatures and pressures selected for the preceding simplified example are typical of those that could be expected in an air conditioner operating with "Freon-12" refrigerant. Notice that of the total heat that leaves the system through the condenser, only about 12.1 per cent of it is heat representing the compressor's contribution to the energy entering the system. The other 87.9 per cent enters through the evaporator coil. This fact is the basis of heat pump design where, under favorable conditions, the heat output of

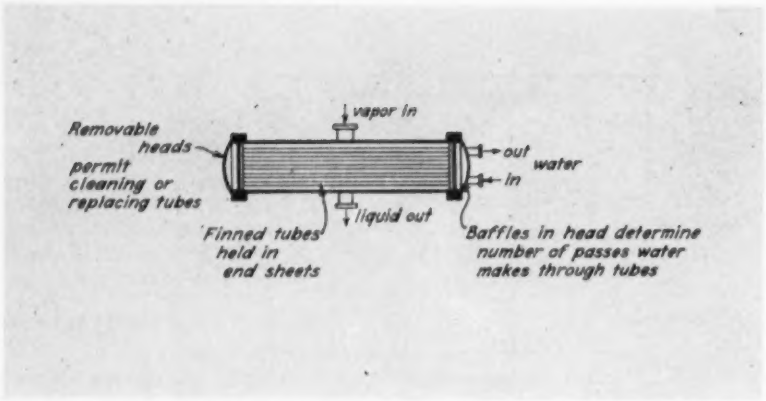

FIG. 3—LARGE INDUSTRIAL type water-cooled condensers are made by running tubes between end sheets which are fastened in a shell having removable heads

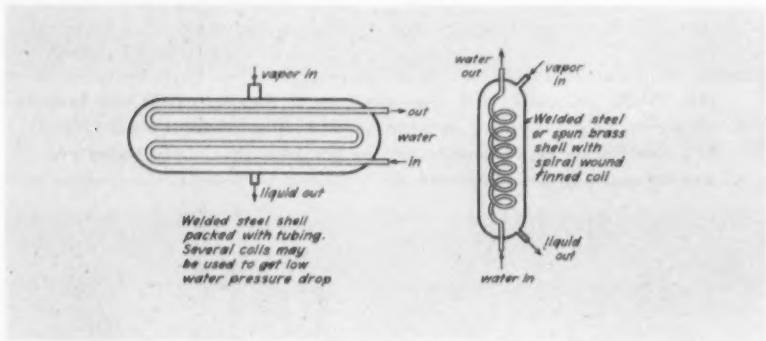

FIG. 4—THE SHELL AND COIL CONDENSER, a modification of the large shell and tube condenser, is used on smaller, package-type units

the condenser coil can amount to many times that portion of it representing the work of compression. Since the heat absorbed by the evaporator of a heat pump usually comes from the atmosphere or a low cost water supply, the advantage of converting electrical energy into heat under favorable conditions with this device can be appreciated.

Dealer Should Know Condenser Types

Having reviewed the origins of the heat which a condenser is called upon to remove, we can now turn our attention to the various types of condensers and some of the essential factors involved in their design and operation.

Being primarily interested in mechanical cooling units or air conditioners of small and medium size, the dealer will find it convenient to be familiar with three commonly used types of condensers. These are the air cooled condenser, the water cooled condenser, and the evaporatively cooled condenser.

Air cooled condensers are used on small condensing units such as those found in the household refrigerator or single room type air conditioners. Their use is spreading to larger air conditioners as the limits of water availability for air conditioning are reached. Air cooled condensers consist of rows of tubing, connected by return bends, which pass through metal fins. The fins increase the heat transfer rate between the condensing refrigerant inside the tubes and the air which passes through the finned section. Without fins, much more tubing and a much larger coil would be needed to carry away a like amount of heat. Air cooled condenser construction can be identical with evaporator construction, except that on a given unit the condenser coil would generally be larger since it handles more heat than the evaporator.

Among the advantages of an air cooled condenser are the unit's independence from water availability, from sewer availability, water costs, water pumping costs, water cooling equipment costs (initial, operating and maintenance), and water cooling equipment space requirements.

On the other side of the ledger we would find that an air cooled condenser may require frequent cleaning of its fins for dust and dirt, to keep it operating efficiently. An air cooled condenser requires the circulation of a large amount of air, which means power costs for the fan motor operation. On a given unit, condenser air can approach twice as many cfm as required by the evaporator. This must be drawn from the outside atmosphere and returned to it. Attention must be given to the handling of this air so that its direction and noise will not annoy persons on adjacent properties.

The air cooled condenser has another disadvantage in that for a given size of air conditioner with a certain size compressor motor, less cooling capacity will be obtained than when a water cooled condenser is used. The reason for this is that the temperature of the air used to cool the air cooled condenser is usually warmer than the temperature of the water used to cool a water cooled condenser. Since the capacity of a mechanical cooling system falls off as the "head" or condensing temperature rises, it follows that the unit having the type of condenser which makes use of the coolest cooling medium available will operate with the highest capacity for a given size motor.

Describes Water Cooled Condensers

Water cooled condensers are made in many forms. Large industrial type condensers are made by running tubes between end sheets which are fastened in a shell having removable heads, as shown on Fig. 3. In this type, water enters through the heads which are baffled to make the water take one or more "passes" through the tubes. Heads are removable for cleaning or replacing tubes. The shell and tube type condenser is rare-

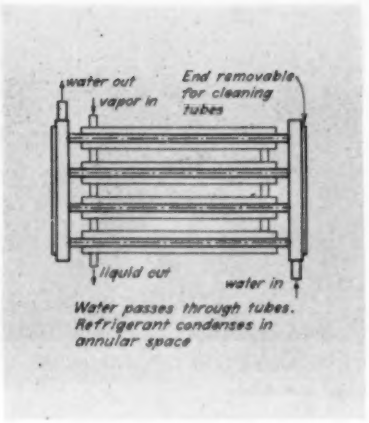

FIG. 5—IN THE DOUBLE PIPE CONDENSER, water flows through the inside of the inner tube while refrigerant vapor condenses in the annular space between tubes

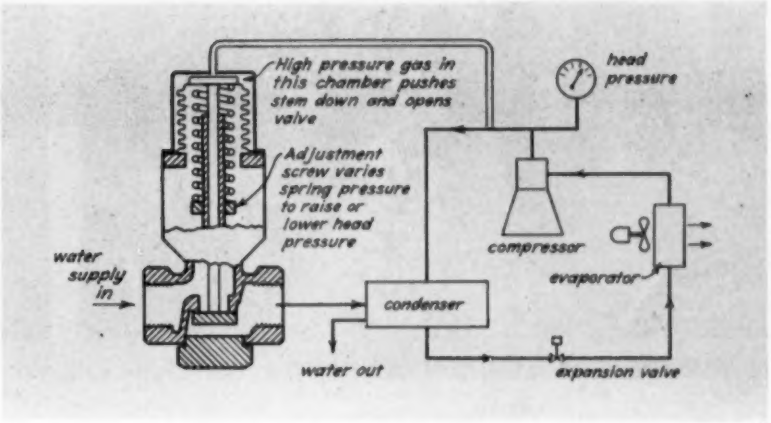

FIG. 6—THE WATER REGULATING VALVE is designed to automatically start, stop, and modulate the flow of condenser water

ly used in the packaged type of air conditioner.

Fig. 4 shows a modification of the large shell and tube condenser. It is used on smaller, packaged-type units. This is known as a shell and coil condenser. Water passes through a continuous spirally or hairpin wound coil which may be divided into several parallel sections. This type condenser can be made at relatively low cost. Shell ends are not removable, but water scale may be removed by treatment with the proper acid solution. Refrigerant condensers were originally made with bare tubing, but demand for more efficient heat transfer and lower cost construction has led to the use of fins on the refrigerant or outside surface of these tubes.

Fig. 5 shows a third water cooled design known as a double pipe condenser. In this unit water flows through the inside of the inner tube while refrigerant vapor condenses in the annular space between the tubes. A popular condenser of this type has removable end plates for cleaning out the water tubes as shown on the sketch.

Of interest to the contractor in considering water cooled condensers is the water pressure drop — especially if he expects to use a cooling tower with the air conditioner. Since the water pressure drop varies with the amount of water flowing, an estimation of the water requirements of the air conditioner is needed. This can be made readily by remembering the following rule of thumb which is approximate for normal air conditioner application:

Gallons per minute per ton = 30/water temp. rise, Deg F

To illustrate the use of this rule, assume that it is desired to know how much water is needed for a 5 ton air conditioner if the water is allowed to rise 20 deg in passage through the condenser. By the equation, 1.5 gpm per ton are needed — or a total quantity of 7.5 gpm.

Water Regulating Valve Used

Water cooled condensers must, of course, be supplied with reasonably cool water in quantity. When the water comes from a sanitary water supply, its temperature will vary considerably depending upon the weather and the source. It would be wasteful to have the water run all the time. Therefore, it is necessary to start and stop the flow automatically as required by the unit. Furthermore, it would be wasteful to have a fixed flow rate of water, since, when the water is cool, less of it is required to remove a certain amount of heat, provided it is allowed to assume a greater temperature rise (see the preceding equation).

To accomplish the task of automatically starting, stopping, and modulating the flow of condenser water, a device known as a water regulating valve is used. This valve is usually placed in the water supply line before the condenser. So placed, it keeps the condenser from being under pressure except when water is flowing, and, if the condenser is self draining, it allows the water to drain out of the condenser each time the unit is shut down. Condensers and water lines must always be drained if they are subject to freezing temperatures. Therefore, a self draining condenser is important to have.

Fig. 6 shows a typical water regulating valve and its application. The bellows of the valve is tied into the refrigerant system on the high pressure side of the compressor by means of a capillary tube. Pressure is required on the bellows to oppose the spring and open the valve. The valve is designed and adjusted so that the pressure required to open it is above any standby pressure that can develop in the refrigerant system when it is not operating.

When the compressor starts to operate, the head pressure increases until it is sufficient to open the valve slightly. As soon as this happens, water starts to flow into the condenser and will begin to condense the high pressure vapor being pumped there by the compressor.

When this takes place the head

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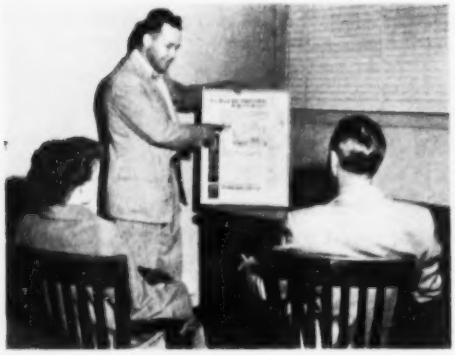
SPONSORSHIP by the Fort Worth Air Conditioning Association . . .

. . . PLUS CAREFUL PLANNING by the educational committee



. . . ADD UP TO an effective advertising campaign directed to prospective home owners who are told that

. . . BECAUSE HOMES built specifically for air conditioning cost less to construct and can be built on less expensive lots

Air Conditioning Pays its Own Way

"DESIGN YOUR HOME for air conditioning, and save the cost of the air conditioning itself," consumers are being told in an advertising campaign sponsored by a local association working together for a common purpose. The campaign, backed by the Fort Worth Air Conditioning Association, has aroused nation-wide interest among air conditioning associations, equipment manufacturers' and home builders' associations.

The theme of the advertising program is that year 'round air conditioning is possible at no extra cost for homes in the $12,000 to $15,000 price range, since the air conditioning itself eliminates many costly features which are necessary to homes which are not air conditioned. In all advertising, to both the consumer market and allied trades, these savings are listed, and their dollar value is estimated.

Many Savings Realized

It is pointed out, for example, that the conditioned home may be built on an inexpensive lot. A side hill or a sheltered, windless location may be used. Sun angles and wind direction are not important factors. Average savings on the lot are estimated at $500.

As to the floor plan, cross ventilation is unnecessary. Therefore, rectangular floor plans may be utilized, with expensive outside wall areas and offsets kept at a minimum. Interior arrangement can be the ruling factor, with wall arrangements adapted to the proper placement of furniture. The ads stress that a conventional type of cottage need not be chosen, and that "style" should not be of as much concern as good design. Savings on the floor plan are estimated at $750.

There are also savings on windows, which are not needed on every outside wall or on all four sides of the house, the ads point out. Windows can be grouped for a view, placed high on a wall so as not to restrict furniture arrangement, etc. Movable sashes aren't required, and picture windows need not be flanked with louvers or casements. When a window is eliminated, so

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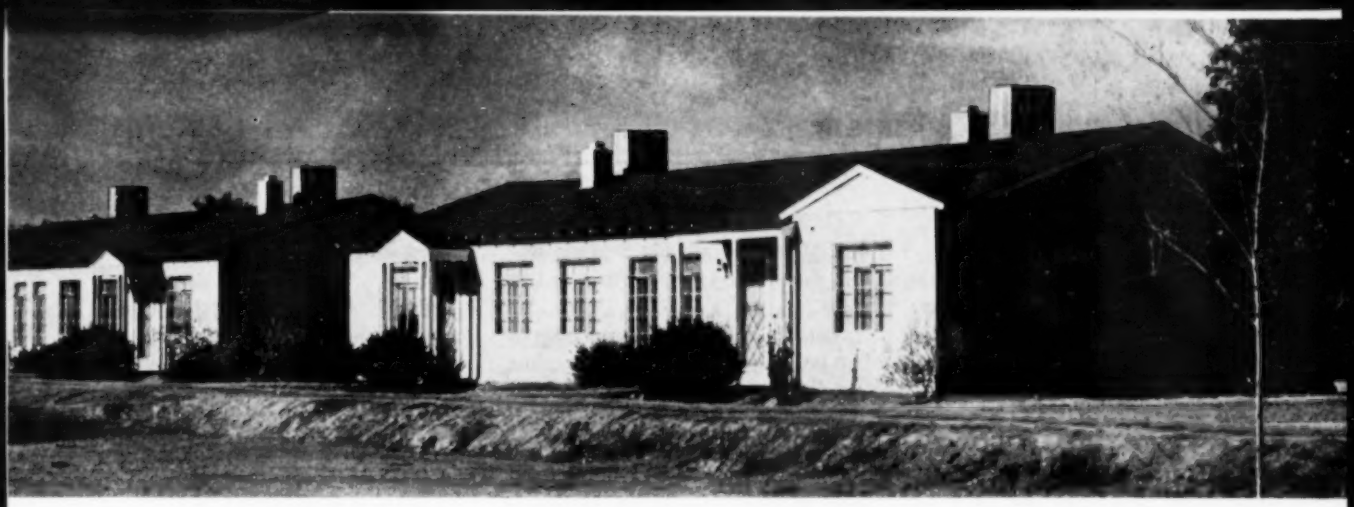


RESIDENTIAL COOLING

Equipment Available This Year

(EVAPORATIVE COOLERS)

THE RESIDENTIAL COOLING FIELD is expected to experience this year its most active season to date. The prospects of how extensive this development will probably be were reviewed in the March American Artisan. The activity in modernizing warm air heated homes — both old and new — with central cooling for summer comfort will be reflected most during the months when people are seeking relief from the heat. There is no better opportunity to talk year 'round comfort than when people are in a comfort-buying mood.

When Are Best Results Obtained?

The seven ways to cool a home were outlined in the April American Artisan. One of these is evaporative cooling, which has been used with satisfactory results in many parts of the country. However, the evaporative cooling principle has proved to be far more effective in some localities than in other areas. This is due to the prevailing climatic conditions characteristic of the individual locality. Evaporative cooling works best where dry bulb temperatures are high, and where there's a good spread between the outdoor dry bulb and the outdoor wet bulb.

Many of the homes with central warm air heating systems are located in areas that are favorable to the use of evaporative coolers. The warm air heating and sheet metal contractor — an authority on air distribution — is the natural installer of central evaporative cooling systems. He understands the installation of ductwork, the characteristics of air flow, and the balancing techniques that are so essential to effective performance of the system for complete comfort.

In areas where the outdoor wet bulb temperature is high during the summer months, manufacturers of evaporative coolers recommend that greater volumes of air be handled. The dimensions of the conditioned space (ceiling height, etc.) and its geographical location enter into consideration. In general, however, manufacturers recommend a complete air change every two or three minutes for areas with low outside wet bulb temperatures, up to every half minute or so for those with high outside wet bulb temperatures.

Due to the high internal heat gain often found in commercial and industrial installations, evaporative cooling may be applicable in such buildings located in areas unsuited to residential applications of evaporative cooling.

To Keep You Informed of Equipment

In previous issues of American Artisan, central mechanical cooling equipment ranging from 1½ to 10 hp for residential application has been reviewed as data became available. This month evaporative coolers are reported on, along with other package cooling equipment and condensing units upon which information has just been made available by the manufacturers. The data has been furnished by the respective manufacturers at the request of American Artisan.

Further articles will continue to keep the Artisan's readers informed of the various types and makes of equipment for centrally cooling homes for comfort.

Central Cooling Equipment . . . . . for Warm Air Systems

Air Cooling

Cabinet: Cold rolled and galvanized metal, 18 and 20 gage, inner walls coated with asphalt varnish.

Filter: Fiber glass filter pad located at side.

Blower: Centrifugal, with front air discharge.

Air delivery: Ranges available from 2000 to 12,000 cfm at 0 in.

Grilles: Adjustable.

Water supply: Models available for both manual and automatic filling with bottom reservoir.

Electrical specifications: Motor ratings vary from 1/15 to 1½ hp; choice of motor voltages, 115, 220.

Special features: Fiber glass mat is kept continuously wetted by a spinning disc; adaptable to roof top and duct installations.

Manufacturer: Air Cooling Engineering Co., P. O. Box 744, Evanston, Ill.

Airfan

Cabinet: 10-24 gage galvanized metal, rubber painted to reduce erosion.

Filter: Spun glass and copper.

Blower: Centrifugal, with top horizontal air discharge.

Air delivery: Ranges available from 2800 to 12,000 cfm at 0 static pressure and 2500 to 9500 at ¼ in. static pressure.

Grilles: Non-adjustable.

Electrical specifications: 110 volt or 220 volt, single and 3 phase motor; motor ratings vary from 1/3 to 5 hp.

Special features: Water from a bottom reservoir is sprayed against the filter pad by a motor operated impeller to obtain complete saturation of the filter pad; eliminator fiber glass pads are used to reduce carry-over vapor to the blower compartment.

Manufacturer: Airfan Engineering Co., 7401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.

Alton

Cabinet: 20 gage galvanized iron, specially treated to reduce erosion.

Filter: Aspenwood or fiber glass pad, located at rear of unit.

Blower: Centrifugal type; horizontal air discharge.

Air delivery: Ranges available from 4000 to 12,000 cfm at 0 in.

Grilles: Adjustable.

Water supply: Automatic filling with bottom reservoir.

Electrical specifications: 110 volt or 220 volt single phase and 220 volt or 440 volt 3 phase motor; motor ratings vary from ½ to 2 hp.

Special features: Water is metered to pad by spray system.

Manufacturer: Alton Mfg. Co., 1112 Ross Ave., Dallas 2, Texas.

Auburn Foundry

Cabinet: Hot rolled and galvanized metal, 14-16 gage, inner walls coated with water resisting aluminum paint.

Filter: Aspenwood filter pad located on side of unit.

Blower: Centrifugal, with bottom horizontal air discharge.

Air delivery: Ranges available from 850 cfm to 10,000 cfm at 0 in. static pressure.

Grilles: Adjustable.

Water supply: Automatic filling with bottom reservoir.

Electrical specifications: 110 volt or 220 volt; motor ratings vary from 1/6 to 1½ hp.

Special features: Water is metered to pad through louvered troughs; blower and motor are rubber mounted; duct to outside permits installation within a building using a window opening for taking in the outside air.

Manufacturer: Auburn Foundry, Inc., Stoker Div., Auburn, Ind.

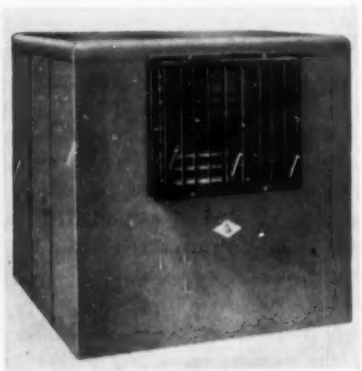
Beyer

Cabinet: Galvanized steel, 24 to 26 gage for room and home units.

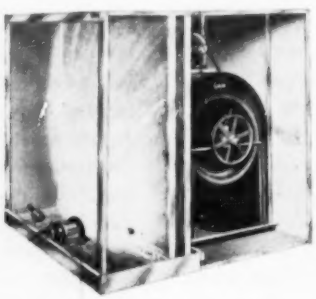
Filter: Aspen pad located on either side or rear.

Blower: Propeller type for room and home units; horizontal air discharge.

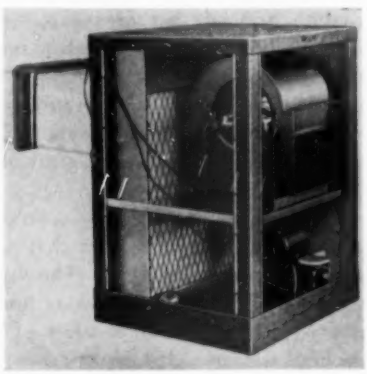
Air delivery: Ranges available from 1000 to 10,000 cfm at 0 in. static pressure.



Air Cooling Engineering Co.



Alton Mfg. Co.



Auburn Foundry, Inc.

Grilles: Non-adjustable.

Water supply: Automatic filling with bottom reservoir.

Electrical specifications: 110 volt or 220 volt motor; motor ratings vary from 1/40 to ¾ hp.

Special features: Water is metered to pad by individual troughs.

Manufacturer: Beyer Metal Products Co., Rosamond, Calif.

Essick

Cabinet: Galvanized, zinc, or lead coated steel.

Filter: Redwood and aspen filter pads.

Blower: Centrifugal or propeller.

Air delivery: Ranges available from 2200 cfm to 12,500 cfm at 0 in. static pressure and 1800 cfm to 12,000 cfm at ¼ in. static pressure.

Grilles: Adjustable.

Water supply: Models available for both manual and automatic filling.

Electrical specifications: Motor sizes from ¼ to 2 hp.

Special features: Air can be discharged either horizontally or downward. Special mesh on exterior of moisturing pad to reduce clogging; models without grilles available for duct installations.

Manufacturer: Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.

Farr

Cabinet: 16 gage galvanized metal.

Filter: Permanent, zinc electroplated, 14 mesh steel screen; located at front of unit.

Blower: Centrifugal, with top horizontal air discharge.

Air delivery: Ranges from 2500 to 6000 cfm at 0 in. static pressure.

Grilles: Non-adjustable.

Water supply: Automatic filling, with bottom reservoir.

Electrical specifications: 110 volt or 220 volt motor; motor ratings vary from ½ to 1 hp.

Special features: Evaporating surface is a revolving copper alloy rotor; cabinet has two doors for easy accessibility; special flange for duct connection.

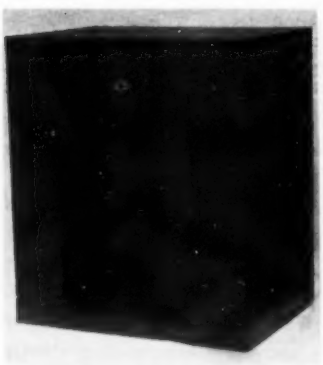
Manufacturer: Farr Co., P. O. Box 10187, Airport Station, Los Angeles 45, Calif.

International

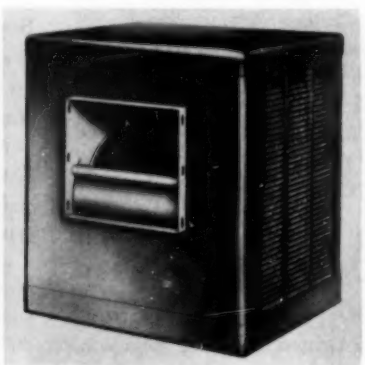
Cabinet: 14-22 gage galvanized sheet steel, specially treated to reduce erosion; also zinc coated steel models.

Filter: Chemically treated aspen fiber located on sides and rear.

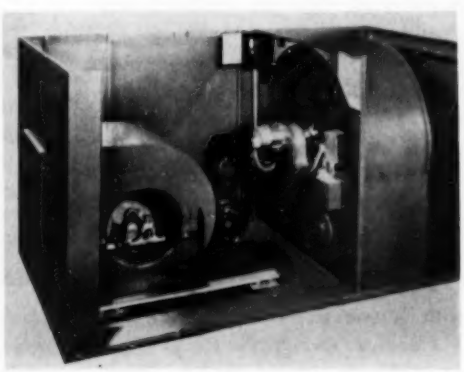
Blower: Centrifugal or propeller.



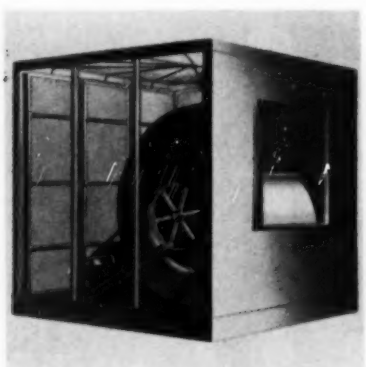
Beyer Metal Products Co.



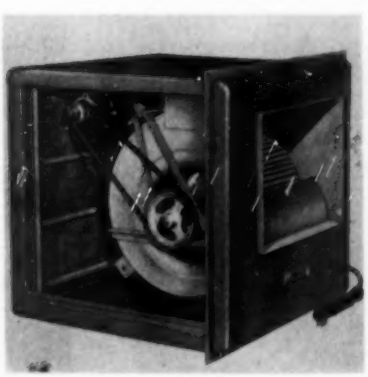
Essick Mfg. Co.



Farr Co.



International Metal Products Co.



Lennox Furnace Co.

Air delivery: Ranges available from 2000 to 15,000 cfm at 0 in. static pressure; 1790 to 14,210 cfm at ¼ in. static pressure.

Grilles: Both adjustable and non-adjustable models offered.

Water supply: Models available for both manual and automatic filling with bottom reservoir.

Electrical specifications: 115 volt or 220 volt motor; motor ratings vary from 1/15 to 2 hp.

Special features: Air can be discharged either horizontally or vertically; water is metered to pad by cast bronze distribution meter; duct distribution models available for roof-top and wall installations.

Manufacturer: International Metal Products Co., 500 S. 15th St., Phoenix, Ariz.

Lennox

Cabinet: 20 to 24 gage galvanized metal, specially treated to reduce erosion.

Filter: Aspenwood pad located on either side or rear.

Blower: Centrifugal type, horizontal air discharge.

Air delivery: Ranges available from 2040 cfm to 3620 cfm at 0 in. static pressure.

Grilles: Adjustable.

Water supply: Automatic filling with bottom reservoir.

Electrical specifications: 115 volt or 230 volt motor; motor ratings vary from ¼ to ½ hp.

Special features: Water is metered to pad by a drip trough.

Manufacturer: Lennox Furnace Co., 2140 S. Main St., Fort Worth, Tex.

National

Cabinet: Galvanized and cold rolled metal, 16-24 gage.

Filter: Patented odorless pads located on either side or rear.

Blower: Centrifugal or propeller type available, with horizontal air discharge.

Air delivery: Ranges available from 2500 cfm to 15,000 cfm at 0 in. static pressure and from 2000 cfm to 12,000 cfm at ¼ in. static pressure.

Grilles: Adjustable.

Water supply: Models available for both manual and automatic filling with bottom reservoir.

Electrical specifications: 115 volt or 220 volt; motor ratings vary from 1/15 to 2 hp.

Special features: Water is metered to pad through special distribution troughs.

Manufacturer: National Engineering & Mfg. Co., 519 Wyandotte, Kansas City, Mo.

Palmer

Cabinet: All zinc coated steel, specially treated to reduce corrosion.

Filter: Aspen pad located on either side or rear.

Blower: Centrifugal or propeller type available.

Air delivery: Ranges available from 1000 cfm to 20,000 cfm at 0 in. static pressure.

Grilles: Both adjustable and non-adjustable models offered.

Water supply: Models available for both manual and automatic filling with either top or bottom reservoir.

Electrical specifications: 115 volt or 220 volt, single phase model for residential and commercial applications; motor ratings vary from 1/40 to 3 hp.

Special features: Air can be discharged either horizontally or downward from spot locations; ductwork can be attached for multiple outlets; water is metered to pad by a metering regulator.

Manufacturer: Palmer Mfg. Corp., 2200 W. Fillmore, Phoenix, Ariz.

Southern

Cabinet: Galvanized aluminum, 18-26 gage; painted to reduce erosion.

Filter: Aspen pad located on either side or rear.

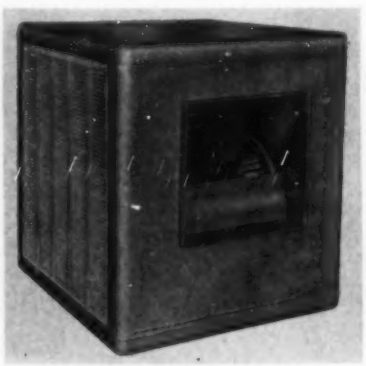
Blower: Centrifugal or propeller type available.

Air delivery: Ranges available from 1500 cfm to 12,500 cfm at 0 in. static pressure and from 1000 cfm to 8000 cfm at ¼ in. static pressure.

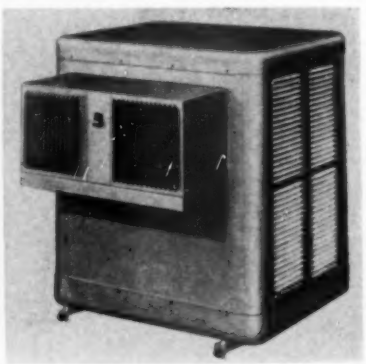
Grilles: Adjustable.

Water supply: Models available

National Engineering & Mfg. Co.



Palmer Mfg. Corp.



Thermador Electrical Mfg. Co.

for both manual and automatic filling with bottom reservoir.

Electrical specifications: 110 volt or 220 volt; motor ratings vary from 1/25 to 1½ hp.

Special features: Air can be discharged either horizontally or vertically; also suitable for adopting to duct system; water is metered to pad by drip or spray method.

Manufacturer: Southern Air Conditioning Mfg. Co., 1309 Calhoun St., Fort Worth 2, Texas.

Thermador

Cabinet: Galvanized sheet metal.

Filter: Aspen pad — sides and rear.

Blower: Propeller and centrifugal models available.

Air delivery: Ranges from 800 cfm to 5000 cfm at 0 in. static pressure.

Grilles: Non-adjustable.

Water supply: City water connection to bottom reservoir.

Electrical specifications: Motor ratings vary from ¼ to ½ hp — 110 volts.

Special features: Special hangers for ceiling installations; adapter for duct system connection.

Manufacturer: Thermador Electrical Mfg. Co., Inc., 5119 District Blvd., Los Angeles 22, Calif.

Thompson

Cabinet: 20-22 gage porcelain enamel, treated to reduce corrosion.

Filter: Aspenwood pad located either at side or rear.

Blower: Centrifugal or propeller type available; horizontal air discharge.

Air delivery: Ranges available from 1600 to 4400 cfm at 0 in. static pressure.

Grilles: Adjustable.

Water supply: Automatic filling with bottom reservoir.

Electrical specifications: 115 volt or 220 volt; motor ratings vary from 1/20 to ½ hp.

Special features: Water is metered to pad by a 3-way water distributor; duct model available without directional grilles.

Manufacturer: A. F. Thompson Mfg. Co., 1040 Vernon St., Huntington, W. Va.

Trade-Wind

Cabinet: 16 to 20 gage steel, specially treated with rust resistant paint to reduce erosion.

Filter: Aspen pad located on either side or rear.

Blower: Centrifugal or propeller type available; horizontal air discharge.

Air delivery: Ranges available from 300 to 10,000 cfm at 0 in. static pressure and from 270 to 9200 at ¼ in. static pressure.

Grilles: Both adjustable and non-adjustable models offered.

Water supply: Models available for both manual and automatic filling with bottom reservoir.

Electrical specifications: Motor ratings vary from 1/35 to 1 hp; choice of 115 or 220 volt motor.

Special features: Water is metered to pad through troughs.

Manufacturer: Trade-Wind Motorfans, Inc., 5725 S. Main St., Los Angeles 37, Calif.

Utility

Cabinet: Galvanized steel.

Filter: Aspen fiber filter pads.

Blower: Centrifugal or propeller type available.

Air delivery: Ranges available from 1000 cfm to 12,600 cfm at 0 in. static pressure and from 1450 cfm to 11,150 cfm at ¼ in. static pressure.

Grilles: Single and double directional models offered.

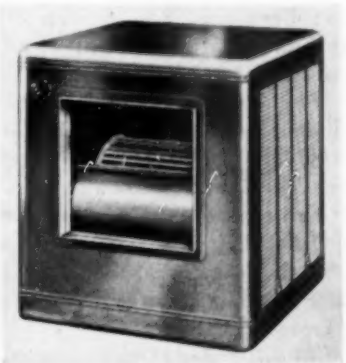
Electrical specifications: 115 volt or 230 volt, single phase motor; motor ratings vary from 1/40 to 2 hp.

Special features: Water is metered to pad through adjustable troughs.

Manufacturer: Utility Appliance Corp., 4851 S. Alameda St., Los Angeles 58, Calif.

A. F. Thompson Mfg. Co.

Trade-Wind Motorfans, Inc.



Utility Appliance Corp.

Condensing Units for Home Air Conditioning

(Specifications of equipment made available since April report)

[The refrigerant quantity shown for the following condensing units indicates only the charge contained at the time the unit leaves the factory.]

Carrier

Two hp unit: Refrigerant "Freon"; semi-hermetic compressor; dimensions of air cooled condensing unit, 33½ in. long, 29¼ in. wide, 19¾ in. high; dimensions of water cooled unit, 28¼ in. long, 18¾ in. wide, 19½ in. high.

Three hp unit: Refrigerant "Freon-12"; semi-hermetic compressor; dimensions of condensing unit, 32⅝ in. long, 14 in. wide, 24⅞ in. high.

Five hp unit: Refrigerant "Freon-22"; semi-hermetic compressor; dimensions of condensing unit, 36¾ in. long, 14 in. wide, 25⅞ in. high.

Seven and one-half hp unit: Refrigerant "Freon-22"; semi-hermetic compressor; dimensions of condensing unit, 35½ in. long, 28½ in. wide, 21 in. high.

Manufacturer: Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y.

Copeland

One and one-half ton unit: 23,000 Btu per hr; dimensions, 28¼ in. long, 18¾ in. wide, 19½ in. high; receiver capacity 19 1/3 lb "Freon-12".

Two ton unit: 29,980 Btu per hr; dimensions, 28¼ in. long, 18¾ in. wide, 21½ in. high; receiver capacity 19-1/3 lb "Freon-12".

Three ton unit: 47,300 Btu per hr; dimensions, 36⅛ in. long, 21½ in. wide, 25½ in. high; receiver capacity 41 1/5 lb "Freon-12".

Five ton unit: 73,250 Btu per hr; dimensions, 36⅛ in. long, 21½ in. wide, 27½ in. high; receiver capacity 41 1/5 lb "Freon-12".

Seven and one-half ton unit: 109,900 Btu per hr; dimensions, 39½ in. long, 20 in. wide, 31½ in. high; receiver capacity 37 1/10 lb "Freon-12".

All units: Semi-hermetic compressor; available in all voltage ranges.

Installation features: Can be installed by contractor without special tools or equipment.

Servicing features: Compressors can be opened for field service; cylinder heads are bolted on, with gaskets for sealing.

Manufacturer: Copeland Refrigeration Corp., Sidney, Ohio.

Curtis

Two ton unit: 24,000 Btu per hr.

Three ton unit: 38,750 Btu per hr; 2 cylinder compressor; refrigerant charge "Freon-12" 15 lb; dimensions, 31⅛ in. long, 18 in. wide, 25¼ in. high.

Five ton unit: 60,000 Btu per hr.

Seven and one-half ton unit: 90,000 Btu per hr.

All units: 220 or 440 volt motor; single phase on 2, 3, and 5 ton units, 3 phase on 7½ ton unit; open type compressor; shell and coil type condenser.

Installation features: Oil separator optional equipment.

Servicing features: Open type unit facilitates servicing.

Manufacturer: Curtis Refrigerating Machine Div., Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20, Mo.

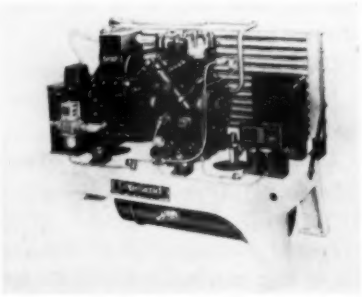
Lehigh

Two ton unit: 22,000 Btu per hr; refrigerant charge "Freon-12" 1 lb; 2 cylinder open type reciprocating compressor; air cooled condenser; dimensions, 38 in. long, 26 in. wide, 23 in. high.

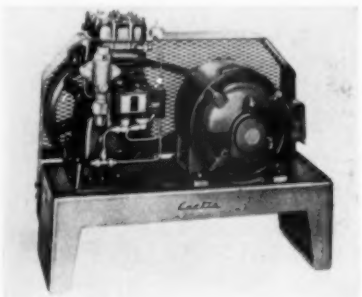
Three ton unit: 31,000 Btu per hr; refrigerant charge "Freon-12" 1 lb; 2 cylinder open type reciprocating compressor; air cooled condenser; dimensions, 38 in. long, 28 in. wide, 23 in. high.

Five ton unit: 64,000 Btu per hr; refrigerant charge "Freon-12" 5 lb; 4 cylinder open type reciprocating

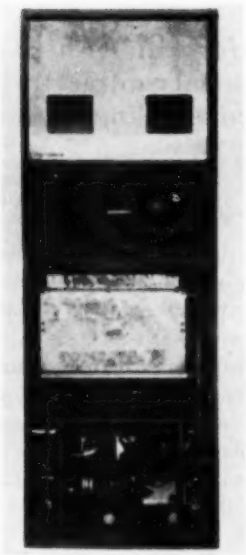
Carrier Corp.



Copeland Refrigeration Corp.



Curtis Refrigerating Machine Div.



Bal-Air, Inc.

compressor; water consumption 10.5 gal per ton; dimensions, 41 in. long, 24 in. wide, 32 in. high.

All units: Single or 3 phase, 220 or 440 volt motor.

Installation features: Can be installed by contractor without special tools or equipment.

Servicing features: All internal repairs can be made on the job.

Manufacturer: Lehigh Mfg. Co., P.O. Box 1418, Lancaster, Pa.

Year 'Round and "Cooling Only" Packages

(Specifications of equipment made available since April report)

Bal-Air

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; single phase, 230 volt motor; refrigerant charge "Freon-12" 10 lb; full hermetic compressor.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; single or 3 phase, 230 volt motor; refrigerant charge "Freon-12" 14 lb; full hermetic compressor.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; single or 3 phase, 230 volt motor; refrigerant charge "Freon-12" 18 lb; semi-hermetic compressor.

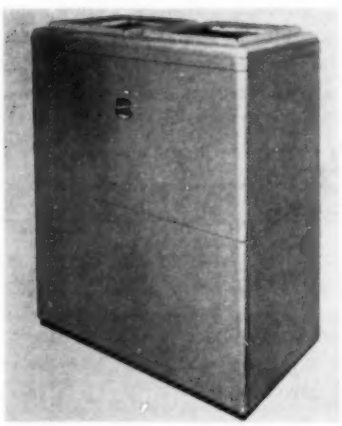
Seven and one-half ton unit: 90,000 Btu per hr; 3000 cfm air circulation; 3 phase, 220 or 440 volt motor; refrigerant charge "Freon-12" 24 lb; open type compressor.

All units: Water consumption 1.5 gal per ton.

Installation features: ½ in. water supply, 1¼ in. gravity drain, electrical connection and small duct for attaching evaporative condenser directly to unit.

Servicing features: Access to all movable parts; standard equipment makes replacement parts obtainable from jobbers.

Manufacturer: Bal-Air, Inc., 1210 McGavock St., Nashville, Tenn.



United States Radiator Corp.

United States Radiator

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; refrigerant charge "Freon-12" 6 lb.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12" 9 lb.

Both units: Single phase, 230 volt motor; semi-hermetic compressor; fiber glass insulation; throwaway filters.

Installation features: Simplified water connections.

Servicing features: Eight removable panels make all parts readily accessible.

Manufacturer: United States Radiator Corp., 300 Buhl Bldg., Detroit 31, Mich.

In the March American Artisan, specifications on year 'round and "cooling only" packaged equipment were given for 1½ to 6 hp units available from 33 manufacturers.

In April, four other manufacturers' specifications on equipment ranging from 1½ to 10 hp were given.

Also made available in April were specifications on 7½ to 10 hp year 'round and "cooling only" packaged equipment manufactured by 10 companies.

Condensing unit specifications for 10 different makes of equipment were reported in April.

Future articles will include specifications for other equipment used to cool residences. Heat pump specifications will be reported in June.

Housing Census Summarizes Warm Air Heating Market

. . . offering information which can help warm air dealers and sheet metal contractors determine their most effective selling areas

THE BUREAU OF THE CENSUS is now issuing 1950 Census of Housing data which provides a good deal of information on the heating of dwelling units. Included is information on the number of dwelling units in a community or area; how many are relatively new or fairly old; the extent to which they have central heating systems; how many of them are heated by warm air; and what fuels are used for each state, numerous metropolitan areas, urbanized areas, urban places, counties, etc.

Two of the most important of the publications now being issued are the Series H-A and the Series H-B Bulletins. The former provide data on general characteristics (including heating), and there is a booklet for each state. The latter provide data on "nonfarm housing" characteristics, and there is a booklet for each of 152 standard metropolitan areas.

Except in New England, each of these metropolitan areas is a county or group of contiguous counties which contains at least one city of 100,000 inhabitants or more. Counties contiguous to the one containing such a city are included in a standard metropolitan area if, according to certain criteria, they are essentially metropolitan in character and are "socially and economically" integrated" with the central city. In short, warm air heating dealers and sheet metal contractors located in the principal city of each area would be in position to do business throughout the area. In New England, the city and town were used in defining standard metropolitan areas by applying a population density criterion.

Four Metropolitan Areas Typical of Information

The two accompanying tables show the sort of heating information included in these census booklets. Four standard metropolitan areas have been selected as typical of the data given.

Number of dwelling units, as reported in this Census, can, for all practical purposes, be interpreted as number of furnaces and boilers in one- and, probably, two-family, structures. In multi-family structures, they cannot be so interpreted, as one heating unit will be used for all dwelling units in the same structure (such as an apartment building). That is why the statistics on steam and hot water are so close to those on warm air for all dwelling units. When analyzed by the types of structures, it is evident that number of warm air furnaces, except in a few areas, far exceeds that of steam or hot water boilers.

Information from the Bureau of the Census indicates that all publications in the H-A (state) and H-B (standard metropolitan area) series can be purchased after May 15, 1953, from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. Prices range from 25 cents to $1.75 for the H-A series, with most state books being listed for less than $1.00. The H-B series publications are priced between 15 and 30 cents.

American Artisan is planning to publish periodically condensed versions of the tables from other Census of Housing bulletins. They should be useful to contractors, wholesalers and manufacturers in defining markets and setting sales potentials.

Types of Fuel Used in Centrally Heated Dwelling Units (For Selected Standard Metropolitan Areas)

Subject	Standard Metropolitan Areas					
	Evansville, Ind.	Fort Wayne, Ind.	Bridgeport, Conn.			Greensboro-High Point, N.C.
	Vanderburgh County	Allen County	The area	Fairfield County (part)*	New Haven County (part)*	Guilford County
All dwelling units	49,575	56,444	77,919	68,487	9,432	51,547
Heating Fuel						
Number reporting heating equipment	47,055	54,115	75,075	65,530	7,545	49,690
Central heating	25,985	40,876	54,230	48,220	6,010	14,610
Coal	20,345	27,945	17,895	16,240	1,655	6,130
Wood	60	395	215	180	35	115
Utility gas	3,440	5,565	4,525	4,270	255	115
Bottled gas	140	145	115	80	35	20
Liquid fuel	1,570	6,350	30,160	26,285	3,875	7,555
Other fuel	345	340	945	835	110	635
Not reported	85	130	375	330	45	40

*Standard Metropolitan area of Bridgeport, Conn., consists of the following parts of Fairfield and New Haven Counties: Bridgeport city, and Fairfield, Stratford, and Trumbull towns in Fairfield County; Milford town in New Haven County.

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built
(For Selected Standard Metropolitan Areas)

Subject	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1- and 2-dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1- and 2-dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Evansville, Ind.—Vanderburgh County															
All occupied units	44,945	29,670	7,790	3,945	2,475	1,065	26,135	22,850	3,285	18,810	6,820	5,225	3,335	2,405	1,025
HEATING EQUIPMENT															
Central heating	25,111	16,809	4,086	2,213	1,545	458	16,952	14,680	2,272	8,159	2,129	2,309	1,788	1,475	458
Piped steam or hot water	3,903	1,004	641	769	1,140	349	1,164	765	399	2,739	239	399	640	1,112	349
Warm air furnace	21,208	15,805	3,445	1,444	405	109	15,788	13,915	1,873	5,420	1,890	1,910	1,148	363	109
Noncentral heating, with flue	16,740	10,855	3,181	1,451	817	436	7,667	6,772	895	9,073	4,083	2,434	1,303	817	436
Nonctrl. htng., without flue; or not htd.	2,430	1,592	355	243	113	127	1,194	1,114	80	1,236	478	315	243	113	87
Not reported	663	414	168	37	...	44	321	284	37	342	130	168	...	...	44
YEAR BUILT															
1945 or later	5,181	4,840	228	25	...	88	4,264	4,167	97	917	673	131	25	...	88
1940 to 1944	5,311	3,093	733	153	893	439	2,855	2,566	289	2,456	527	473	124	893	439
1939 or earlier	33,344	21,026	6,574	3,694	1,512	538	18,489	15,757	2,732	14,855	5,269	4,463	3,113	1,512	498
Not reported	1,059	710	255	74	...	...	456	359	97	583	351	158	74	...	...
Standard Metropolitan Area of Fort Wayne, Ind.—Allen County															
All occupied units	49,870	35,255	8,615	3,915	1,390	695	33,785	30,005	3,780	16,085	5,250	5,590	3,245	1,325	675
HEATING EQUIPMENT															
Central heating	37,835	26,180	6,502	3,269	1,211	673	25,951	22,771	3,180	11,884	3,409	4,000	2,676	1,146	653
Piped steam or hot water	4,366	1,785	1,007	703	448	425	2,187	1,601	586	2,179	182	575	569	448	405
Warm air furnace	33,469	24,397	5,495	2,566	763	248	23,764	21,170	2,594	9,705	3,227	3,425	2,107	698	248
Noncentral heating, with flue	10,448	8,038	1,779	541	90	...	6,979	6,493	486	3,469	1,545	1,370	464	90	...
Nonctrl. htng., without flue; or not htd.	753	588	89	21	36	...	429	406	23	305	182	66	21	36	...
Not reported	859	452	246	84	54	23	429	338	91	430	114	155	84	54	23
YEAR BUILT															
1945 or later	6,164	5,965	165	...	...	34	5,557	5,530	27	607	435	138	...	...	34
1940 to 1944	3,372	3,010	304	58	...	...	2,778	2,778	...	594	232	304	58	...	...
1939 or earlier	39,378	25,794	7,869	3,828	1,303	584	25,011	21,327	3,684	14,367	4,467	4,898	3,158	1,270	574
Not reported	956	486	276	29	87	78	440	370	70	516	116	249	29	54	68
Standard Metropolitan Area of Bridgeport, Conn.—Parts of Fairfield and New Haven Counties*															
All occupied units	72,140	29,420	17,920	13,030	6,575	5,195	55,050	25,250	9,800	37,090	4,170	11,455	10,200	6,205	5,080
HEATING EQUIPMENT															
Central heating	52,253	25,289	13,677	6,516	2,649	4,122	29,954	22,555	7,399	22,299	2,734	8,383	4,650	2,475	4,059
Piped steam or hot water	27,238	12,522	6,105	2,661	1,979	3,971	14,597	11,223	3,374	12,641	1,299	5,633	1,864	1,899	3,946
Warm air furnace	25,015	12,767	7,572	3,855	670	151	15,357	11,332	4,025	9,658	1,435	4,750	2,786	574	113
Noncentral heating, with flue	15,087	2,655	3,222	5,249	3,290	671	3,476	1,675	1,801	11,611	980	2,429	4,451	3,113	658
Nonctrl. htng., without flue; or not htd.	3,006	443	840	983	546	194	677	261	416	2,329	182	537	899	530	181
Not reported	1,789	1,034	179	282	88	206	942	761	181	847	275	86	219	88	181
YEAR BUILT															
1945 or later	5,204	4,488	584	57	49	26	4,486	4,298	188	718	190	396	57	49	26
1940 to 1944	8,276	4,003	1,800	282	934	1,257	4,105	3,841	264	4,171	162	1,585	256	911	1,257
1939 or earlier	56,786	20,011	15,122	12,324	5,494	3,835	25,705	16,626	9,079	31,081	3,585	9,256	9,573	5,147	3,720
Not reported	1,870	916	413	366	98	77	751	483	268	1,119	433	198	313	98	77
Standard Metropolitan Area of Greensboro-High Point, N. C.—Guilford County															
All occupied units	44,085	32,550	6,020	3,200	1,680	655	22,300	20,745	1,555	21,785	11,785	4,915	2,855	1,610	640
HEATING EQUIPMENT															
Central heating	15,983	9,774	1,571	1,353	785	500	9,070	8,316	754	4,913	1,458	1,079	1,138	738	500
Piped steam or hot water	5,291	2,881	654	666	610	480	2,748	2,350	398	2,543	531	408	537	587	480
Warm air furnace	8,692	6,893	917	687	175	20	6,322	5,966	356	2,370	927	671	601	151	20
Noncentral heating, with flue	27,495	20,835	4,175	1,632	755	100	12,252	11,549	703	15,243	9,286	3,620	1,482	755	100
Nonctrl. htng., without flue; or not htd.	2,270	1,721	256	172	101	20	854	814	40	1,416	907	216	172	101	20
Not reported	337	200	20	43	39	35	125	67	58	212	133	...	43	16	20
YEAR BUILT															
1945 or later	9,445	7,917	657	449	262	160	6,385	6,300	85	3,060	1,617	572	449	262	160
1940 to 1944	3,648	2,709	486	84	337	32	2,081	2,024	57	1,567	685	429	84	337	32
1939 or earlier	30,159	21,312	4,735	2,583	1,081	448	13,365	11,967	1,398	16,794	9,345	3,772	2,218	1,011	448
Not reported	818	592	142	84	...	...	455	455	...	363	137	142	84	...	...

*Standard Metropolitan area of Bridgeport, Conn. consists of the following parts of Fairfield and New Haven Counties: Bridgeport city, and Fairfield, Stratford, and Trumbull towns in Fairfield County; Milford town in New Haven County.

"Artisan" Condenses ASHVE Papers on

Pressure Losses in 4-Inch Diameter Galvanized Metal Duct and Fittings
Friction Losses in Round Aluminum Ducts
Room Air Distribution Research for Year 'Round Air Conditioning
Heat Transmitted to the Research Home From the Inside Chimney

Technical papers presented at the 59th annual meeting of the American Society of Heating and Ventilating Engineers covered many phases of the work performed by the warm air heating and sheet metal contractor. These papers have been condensed to contain all essential data of interest to readers of American Artisan. However, if further details of the experimental procedures and equipment are desired, reprints of the complete articles may be obtained free of charge from The American Society of Heating and Ventilating Engineers, 62 Worth St., New York 13, N. Y.

1. Room Air Distribution Research for Year 'Round Air Conditioning

By S. F. Gilman, H. E. Straub, A. E. Hershey, and R. B. Engdahl

ALTHOUGH ENGINEERING methods have been developed for designing winter heating systems and, to a lesser degree, summer cooling systems for residences, the combining of the heating and the cooling operations into a year 'round air conditioning system presents several new and unsolved problems in both duct and room air distribution. In the year 'round air conditioning of residences, economic reasons and operation simplicity normally require that the same supply outlets be used for both the winter heating and the summer cooling operations. As a consequence, one of the problems unique to the year 'round system is that of distributing heated air in winter and cooled air in summer from the same supply outlets in such a manner that satisfactory comfort conditions are maintained at all times. Although the effectiveness of the air distribution in a residence is an extremely important factor in the overall performance of the air conditioning system, engineering data for selecting the proper types and locations of supply outlets utilizing both heated and cooled air are not yet available. The accelerating rate at which year 'round air conditioning is being installed in residences emphasizes the need for air distribution research to obtain such data.

A research project on air distribution in rooms has been initiated at the University of Illinois.

The object of the air distribution program is to obtain engineering data for selecting the proper types and locations of supply outlets which will give satisfactory air distribution in residential rooms during all seasons of the year.

Observations are being made of the air temperatures, velocities, and flow patterns existing at numerous points in a test room under various winter heating and summer

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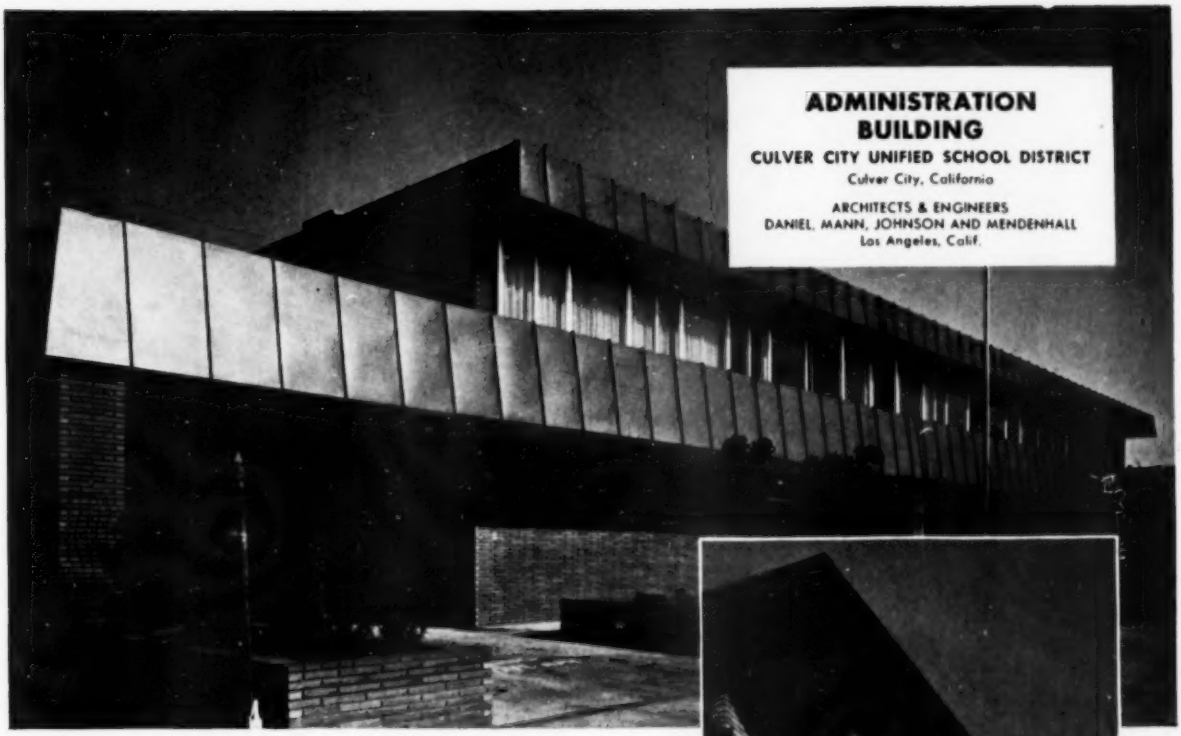

ANOTHER CASE OF

Copper

WHERE IT COUNTS

FROM THE DESIGN AS WELL AS FROM THE UTILITARIAN STANDPOINT

Revere Copper plays a dual role in this building which won an award from the Southern California Chapter of A. I. A. in their annual competition. It has been used in the facias in combination with the brick walls to create an unusual and striking effect. In fact the flexibility in design of Revere Copper is practically limitless. At the same time its non-rusting and enduring qualities place maintenance costs at the vanishing point.

Those are the reasons architects and builders prefer to use this "ageless" metal whenever they can. And sheet metal contractors are glad when it is specified because it is so readily worked and soldered.

In addition to the 2,000 sq. ft. of 16 oz. Revere Sheet Copper being used for the facias, the roof flashing also was made of 16 oz. Revere Sheet Copper, the entire building taking some 2,500 lbs. The Main Cornice Works, Inc., Los Angeles, Calif., were the subcontractors who did the installing, while Brunzell Construction Company, Culver City, Calif. were the general contractors.

Now, with restrictions eased, and quantities permissible without allotments greatly increased, there isn't any reason why your next job can't have the many benefits of Revere Copper. See the Revere Distributor nearest you about Revere Sheet, Strip or Roll Copper for flashing. Particularly ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing.* And, if you have technical problems, he will put you in touch with Revere's Technical Advisory Service.

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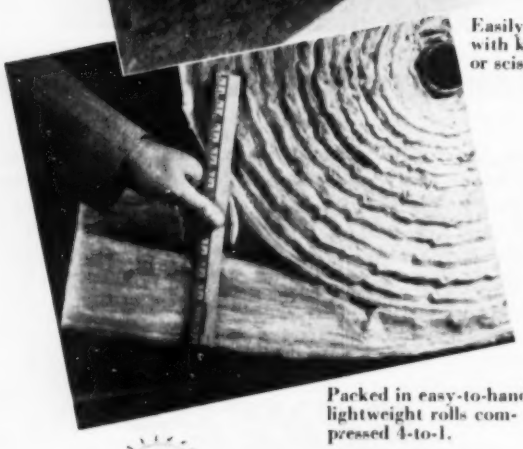
SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

Flexible MICROLITE blanket conforms readily to irregular shapes.

Extremely light in weight with good tensile strength for easy handling in large sections, even overhead.

When you've got ducts to wrap...

You'll save time— You'll do it easiest— with MICROLITE



Easily cut with knife or scissors.

Packed in easy-to-handle, lightweight rolls compressed 4-to-1.

MICROLITE ***Glass Fiber Insulating Wool*** is a natural for wrapping ducts. It's soft—it's resilient—it's pleasant to handle—it's easy to cut.

Extreme light weight of Microlite minimizes attachment and mounting points—without danger of insulation sag. Weighing only ½-pound per cubic foot, enough B-305 Microlite to provide 1″ of insulation on a 1′ x 2′ x 100′ duct weighs only 50 pounds.

Inch for inch, Microlite is one of the most effective of all insulating materials. Half-pound density Microlite has a "k" factor of .25 at 50° mean; a Noise Reduction Coefficient for 1″ thickness of .60. You can't conscientiously proceed with any insulating job until you've investigated Microlite, a product of Glass Fibers exclusive electronic-extrusion process. Write for descriptive Microlite brochure and detailed duct application manual. Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, Ohio.

GLASS FIBERS INC.

Makers of glass fibers by the ELECTRONIC-EXTRUSION process—developed, patented and used exclusively by Glass Fibers Inc.

VITRON Yarns • Rovings • Micro-Fibers • Pipe Wraps • Industrial Mats • MICROLITE Thermal and Acoustical Insulation
DURAMAT Vapor Barriers • VIBRAGLASS Mounting and Packaging Materials • COUSTIC-AIRE and THERMO-JET Aircraft Insulations

You get ALL these Features when you buy PET Drills!

Reserve Power—for the extra-tough job.
Powerful, Continuous-Duty Motors—built in PET's own factory. Dynamically Balanced Armatures—for freedom from vibration.
Six Heavy-Duty Ball and Needle Bearings.
Compact Design—makes hard-to-reach drilling jobs easier and faster.
Aluminum-Alloy Die Castings—for light weight, easy handling.
Forced Ventilation—for cool running.
Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your maintenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound . . . built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line . . . *and they're available to you at a standard drill price!* That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, *mail it today!*

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities: ¼", ⅜" and ½". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.

PET® POWER TOOLS

Plus Power per Pound

PORTABLE ELECTRIC TOOLS, INC.

320 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd., 452 Birchmount Road, Toronto 13, Ontario, Canada

MAIL COUPON FOR FULL INFORMATION

PORTABLE ELECTRIC TOOLS, INC. AA-53
320 W. 83rd St., Chicago 20, Ill.

Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

*Name*_____ *Title*_____

*Company*_____

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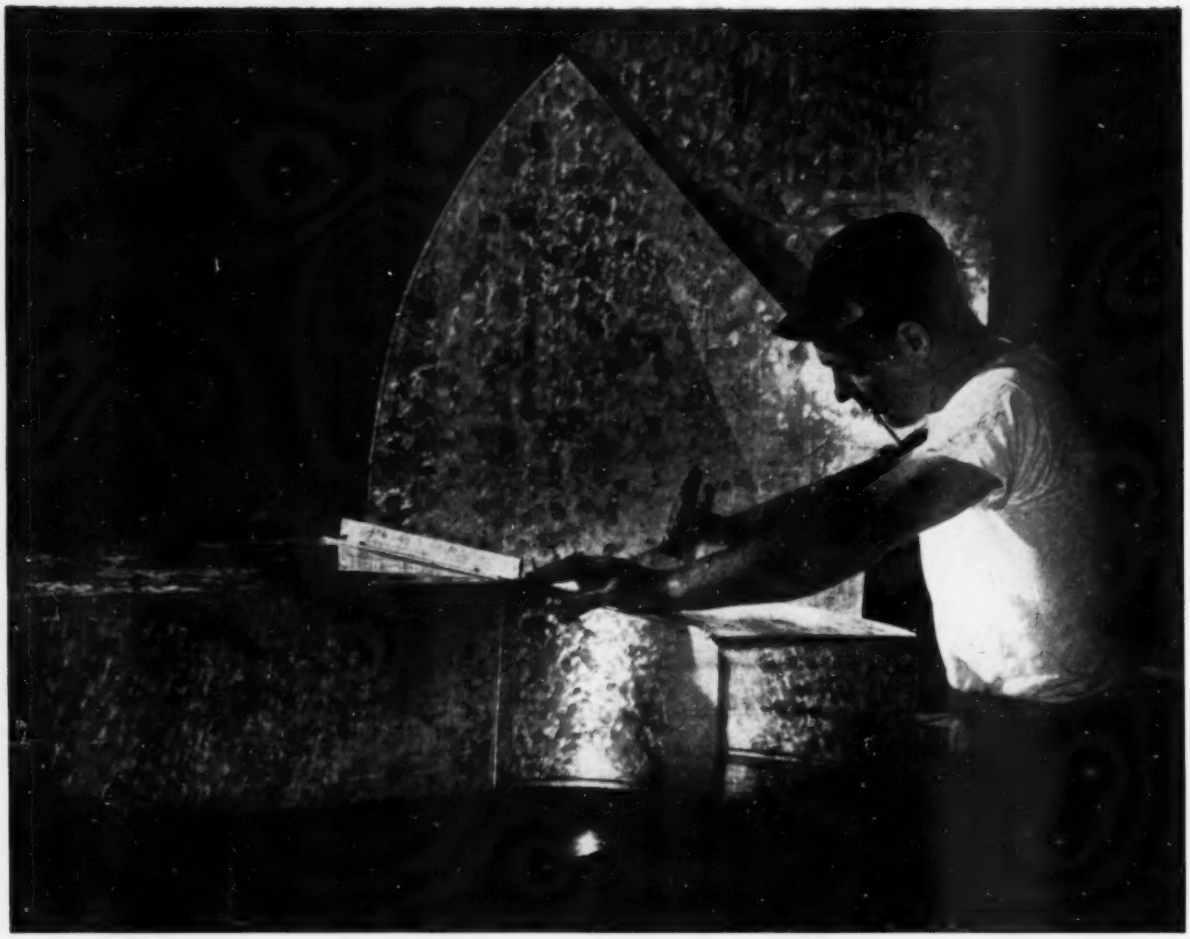


The WORKABLE SHEET
is Galvanized Steel

Bethlehem Galvanized Steel Sheets are simple to fabricate. They can be cut, formed, seamed and soldered with no difficulty, using ordinary shop tools. Smooth, good-looking sheet-metal jobs can be done in minimum time.

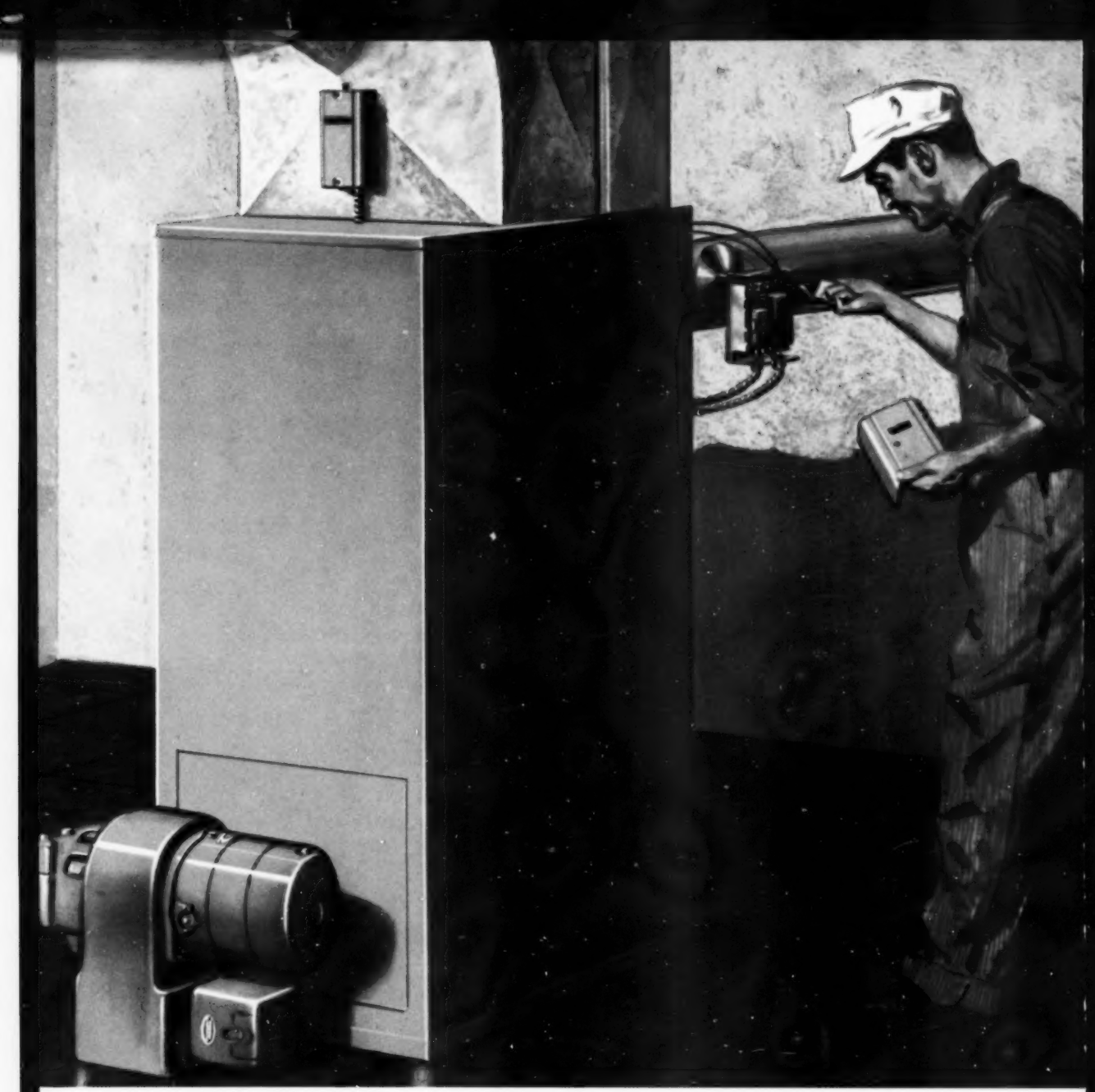
These easy-working sheets are made of strong, durable steel, either plain or copper-bearing. A spangled zinc coating protects them against corrosion. Their cost is low, and they give excellent service. Dollar for dollar there are no better sheets for all-around work than Bethlehem Galvanized Sheets.

Bethlehem
GALVANIZED
Steel Sheets

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: **Bethlehem Steel Export Corporation**



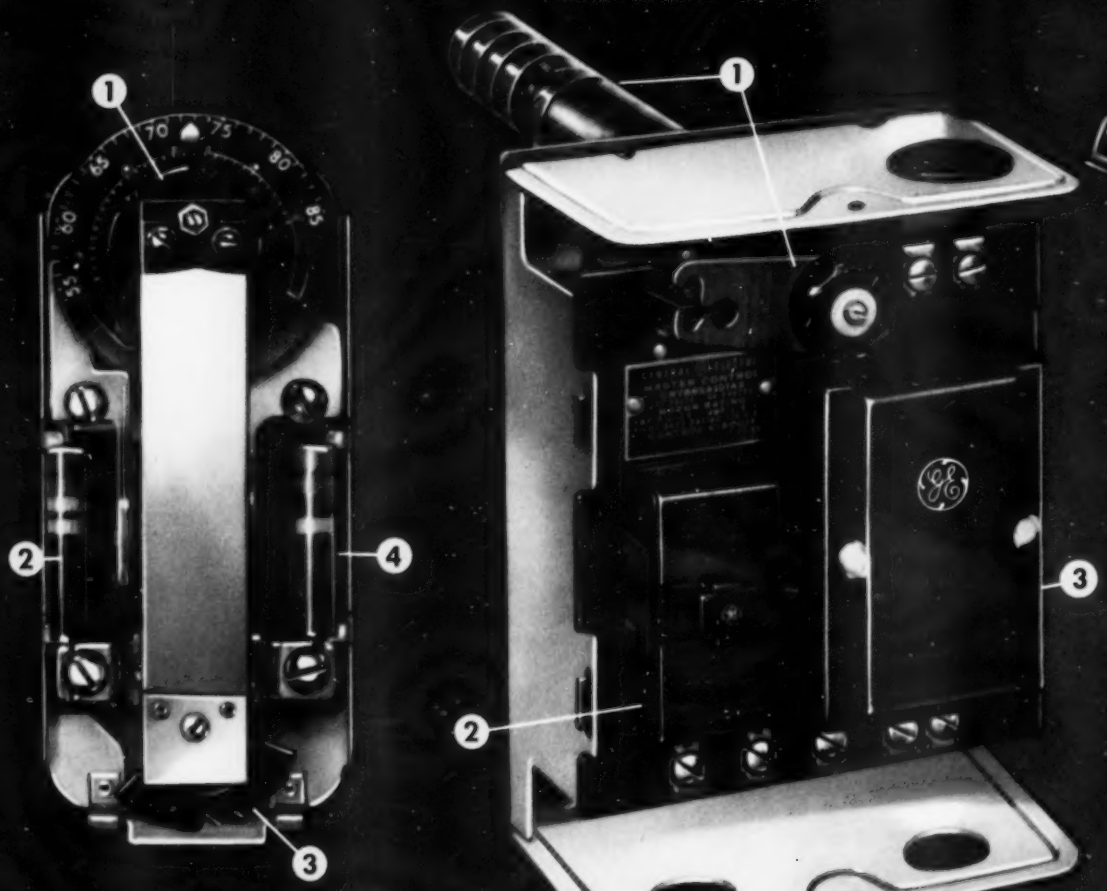
New SIMPLIFIED G-E CONTROLS

Developed and produced by the
G-E APPLIANCE CONTROL DEPARTMENT
FOR ALL MAKES OF HOME OIL BURNERS

Cut on-the-job TIME and COSTS

GENERAL ELECTRIC

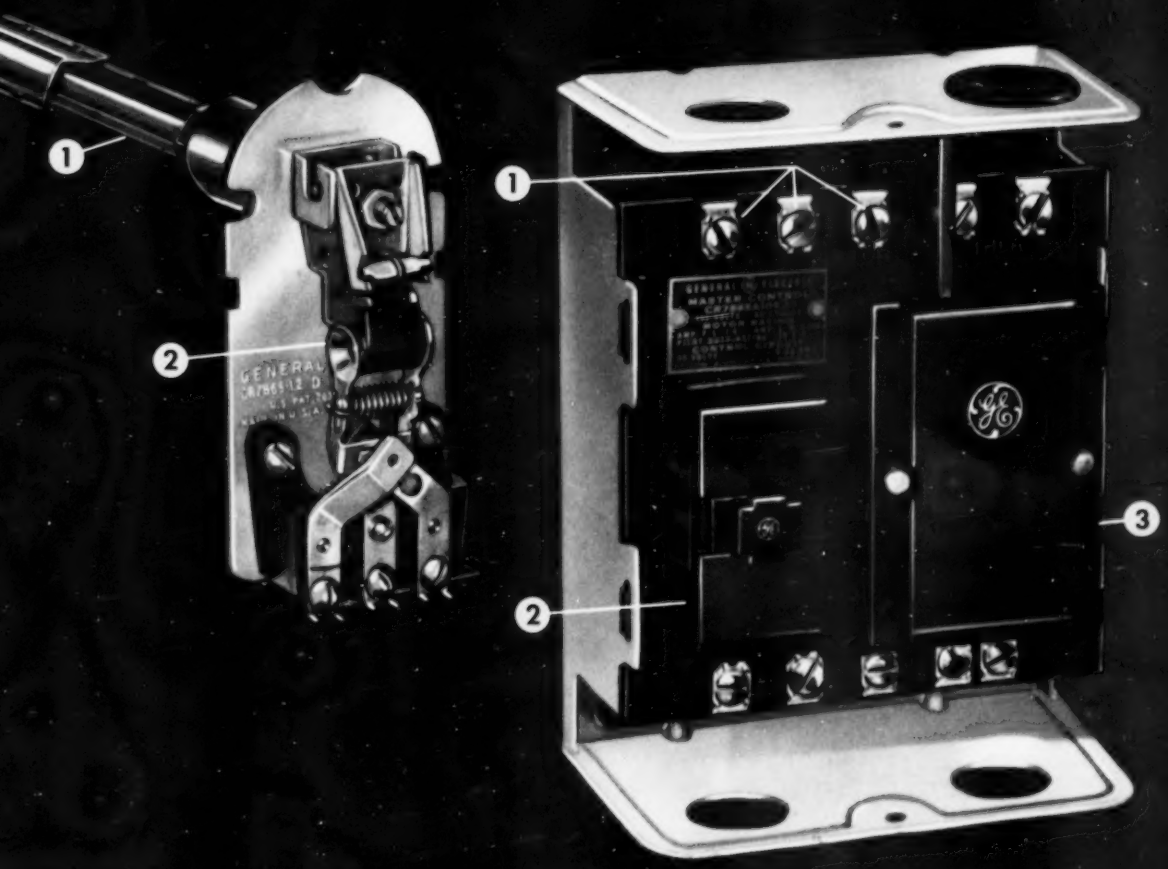
Controls the



ROOM THERMOSTAT is simple to mount . . . easy to wire, adjust and service! Easy-to-remove subbase can stay on wall while plasterers and painters work. Cover (not shown) snaps on. *Calibrates without tools* — just turn the inner dial (1) until contacts close at temperature set on big dial. Overshooting of room temperature is prevented by preheat resistor (2), supplied with thermostat. *Exclusive comfort dial* (3) makes it easy for home owner to adjust burner timing cycle to heating conditions of the home . . . cuts nuisance complaints and unprofitable call-backs. To make this into an automatic day-night thermostat, just add ordinary radio resistor (4) for setback, and a handsome G-E time-switch clock (not shown).

MASTER CONTROL WITH BIMETALLIC HELIX, stack-mounted, needs *no adjustments, no leveling, no call-backs after installation!* Nuisance service calls are cut down by G-E recycling feature that tries a second start if flame fails . . . and it *never needs adjustments!* Quickly installed with an adaptable stack-mounting flange (not shown), rubber grommet for thermostat wires, and plenty of wiring room. Operating units are helix-and-clutch assembly (1), thermal timer (2) and transformer relay (3) . . . all designed for easy servicing. For example, low-cost thermal timer can be replaced in minutes . . . no wasted time trying to adjust this machine-calibrated unit by hand! And enclosures keep out dust, help prevent trouble.

way you want them . . .

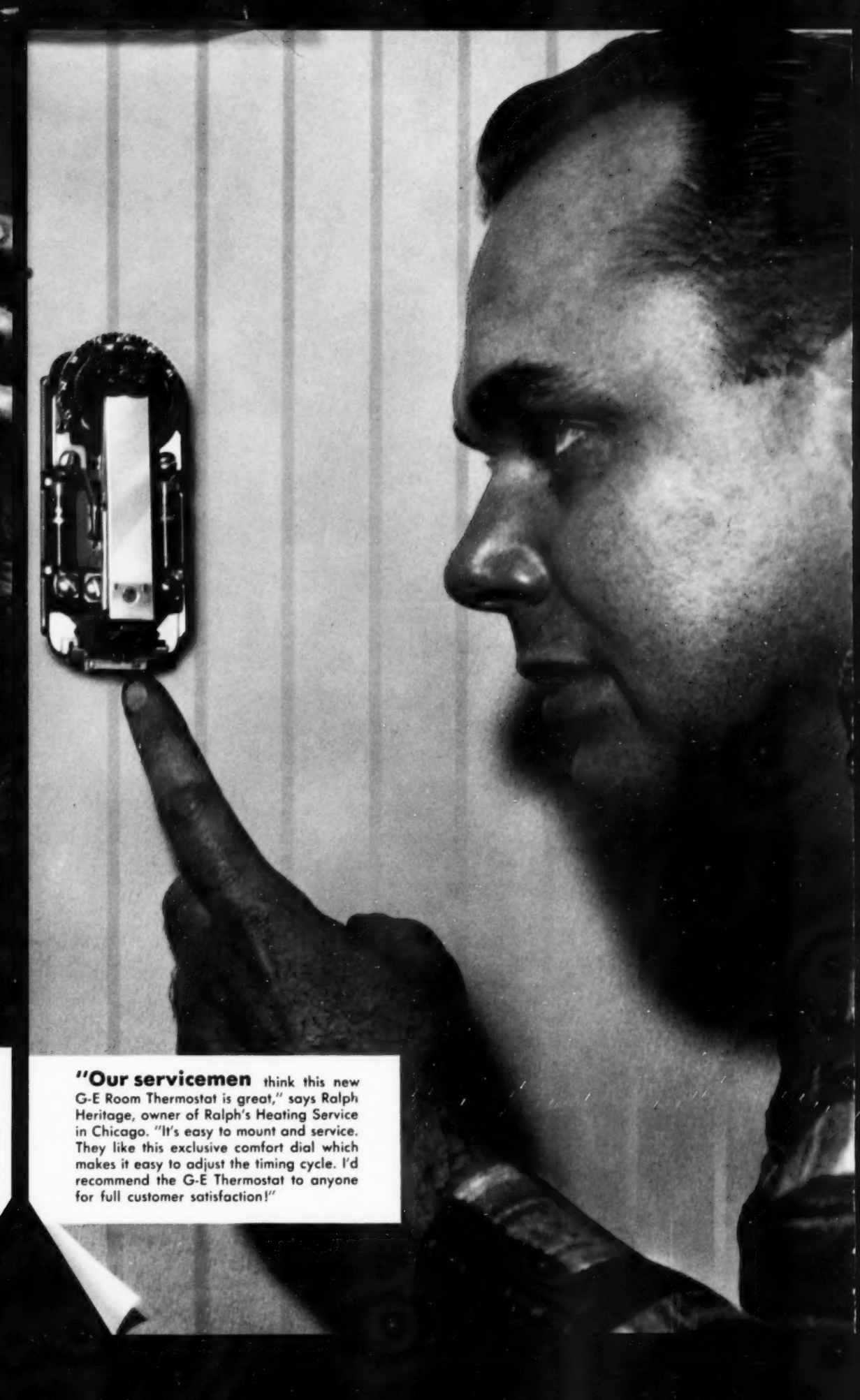


FLAME DETECTOR is a new, tough, simple but *extremely sensitive* control. It is used with a separately mounted master control (right). Easy, flexible installation: this flame detector can be mounted almost any place where temperature changes—including in the stack or combustion chamber. Just as fast and just as efficient as complicated electronic controls, it consists only of a detector rod (1) and switch (2). Nichrome-and-quartz detector rod is practically indestructible . . . yet so sensitive it detects any 30-degree temperature change, and *will shut burner off in four to seven seconds* in case of flame failure!

MASTER CONTROL, used with flame detector (left), mounts on side of furnace or on the gun burner. Needs no leveling and installs very quickly. Just as easy to wire as the stack-mounted master control-with-helix; the three extra terminals (1) connect directly to the flame detector. Note the extra-roomy wiring space! Simple design consists only of thermal timer (2) and transformer relay (3). Not affected by nearby temperatures and has the trouble-saving G-E recycling feature for temporary flame failures. This control *needs no adjustments for any reason*—it is factory-calibrated to work right!

You can put your confidence in—

"Easy service is one of the biggest features of this new G-E Master Control," says Louis D'Allesandro, owner of Crown Oil Burner Company in Boston. "The men in our shop say servicing has been so simplified it's a pleasure. Not only that—this control is easy to install and call-backs are unnecessary. For my money this control is tops!"



"Our servicemen think this new G-E Room Thermostat is great," says Ralph Heritage, owner of Ralph's Heating Service in Chicago. "It's easy to mount and service. They like this exclusive comfort dial which makes it easy to adjust the timing cycle. I'd recommend the G-E Thermostat to anyone for full customer satisfaction!"

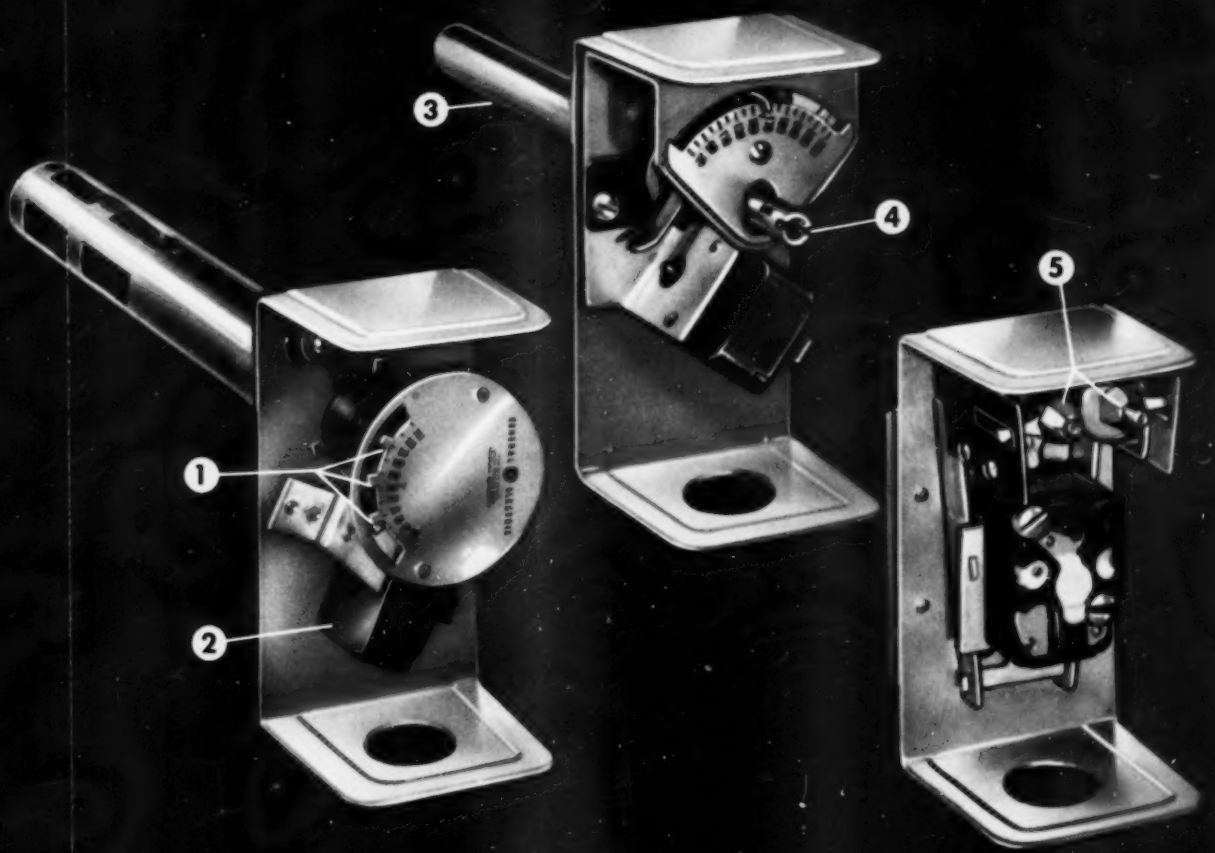
easy to install . . . easy

TRANSFORMER RELAY is a two-purpose control that operates a line voltage load, such as a motor, from a low-voltage thermostat or other control. It is used in oil burners, as well as water circulators, unit heater fans and cooling system condensing units. Has the same convenient wiring features, including plenty of wiring space, and is just as easy to install as the other new G-E oil-burner controls. Two extra terminals (1) are for operating an additional low-voltage circuit, if desired. Operation can be checked quickly by removing plastic cover (2), which protects from dust. Service, seldom if ever necessary, is easy.

FAN AND LIMIT CONTROL, for warm air furnace, operates warm air fan and also protects against excessive bonnet temperatures. Summer switch (1) permits fan-cooling in hot weather. Fan-on and fan-off settings are on top scale (2) . . . fan-on sets anywhere between 100 and 200 degrees. Limit scale (3) sets anywhere between 130 and 250. A mechanical interlock prevents wrong setting that would cause fan-off cycling on the limit switch. Mounts in any position, is easy to install with a simplified mounting flange (not shown). Simple construction: turning helix merely operates two famous positive-action G-E switchettes.

GENERAL ELECTRIC

to service

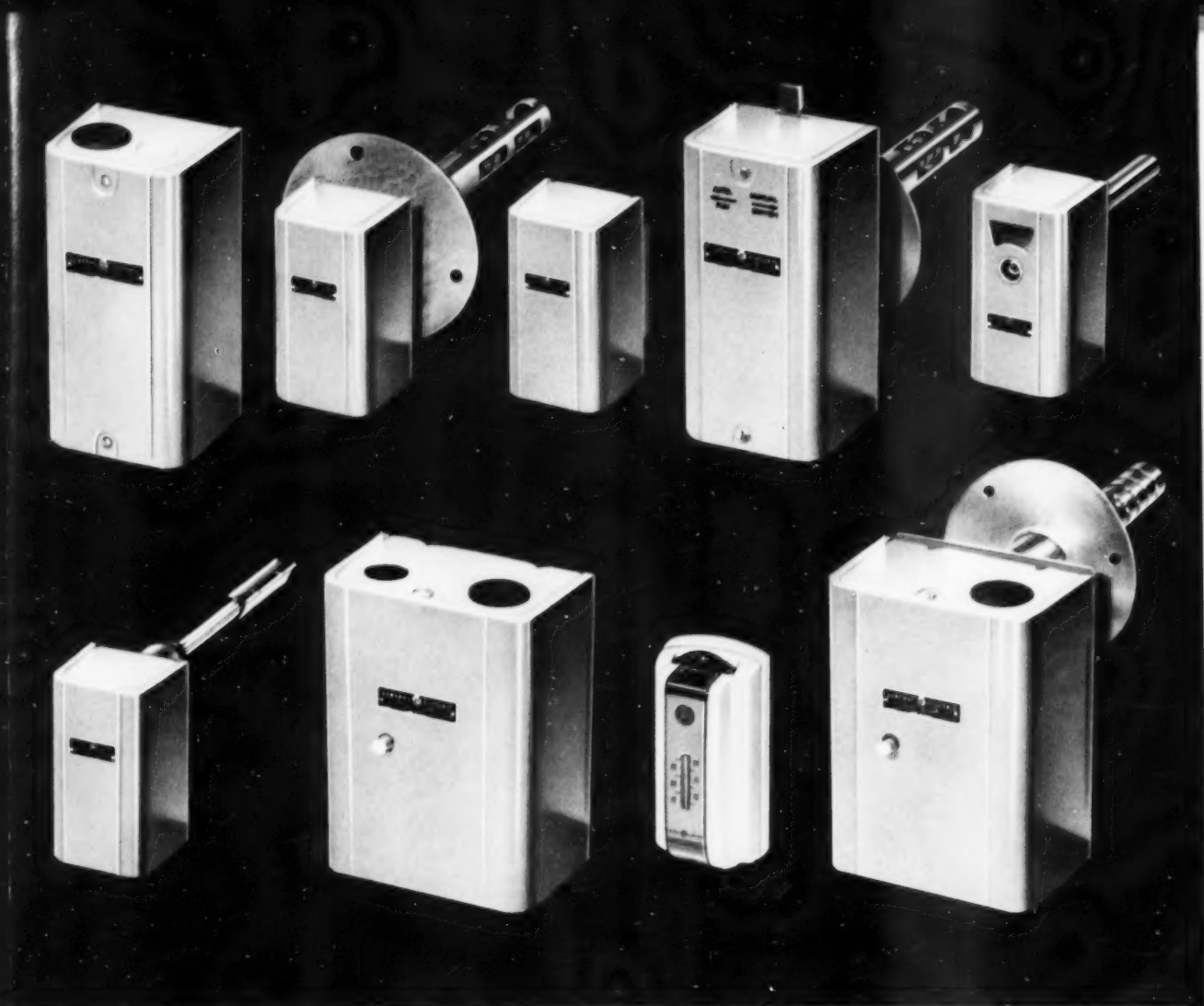


TEMPERATURE LIMIT CONTROL (above, left) for warm air furnaces, like all other new G-E oil-burner controls needs no leveling and is easily installed. To comply with some local ordinances, stops (1) on the temperature dial are at 200, 250 and 300 degrees. They are easy to remove if you don't need them. Visible in the photo is the long-lasting G-E corrosion-proof switchette (2).

WATER IMMERSION TEMPERATURE CONTROL is for hot water systems. Easy installation and servicing (if ever necessary) is provided for by the G-E dry well (3) which protects the helix. The entire control, including helix, can quickly be removed from or placed into the dry well *without tools*. The dry well itself is mounted separately, either in the boiler or water heater supply line. Like the other G-E controls above, this one has an easily removed snap-on cover (not shown). For simple adjustment, however, the setting slot (4) protrudes through the cover and can be turned with a coin.

STEAM PRESSURE CONTROL is available for standard male, female, compression fittings; in any range of pressures and for various types of steam operation. Easy adjustments for range and differential are made by simply turning the acorn nuts (5). And again, like all other new G-E heating controls, this control needs no leveling—it's *easy to install* and *easy to service!*

Send coupon for helpful information ➧



All new G-E oil burner controls mount in any position—All have easy-to-remove, strong, good-looking covers!

Contact your nearest G-E Apparatus Sales Office, or . . .

SEND THIS COUPON FOR HELPFUL INFORMATION!

Section 740-6, General Electric Co., Schenectady 5, N. Y.

Please send me the following:

☐ GEC-1022 Booklet giving descriptive details on new G-E Oil Burner Controls

☐ GEH-1907 Service Manual for G-E Oil Burner Controls

Name _____ Position _____

Company _____

Address _____

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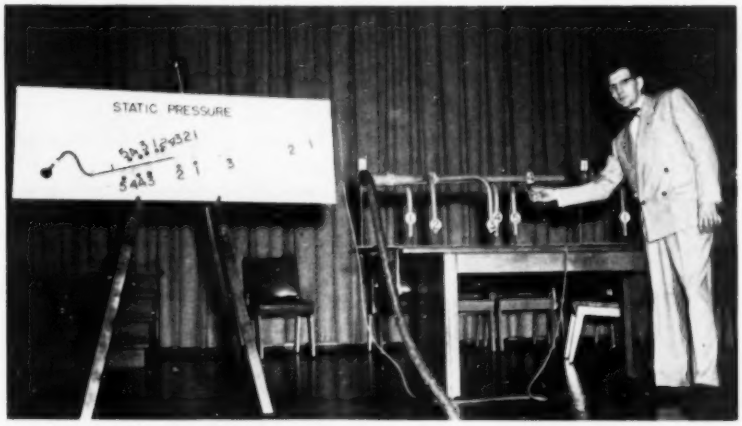
The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.

For further information, contact your nearest G-E Apparatus Sales Office

GENERAL ELECTRIC

"TALKS, NOT PAPERS" . . . .



MANY DEMONSTRATIONS, and . . . .

CLASS-ROOM SESSIONS featured at . . . .

Industrial Ventilation

. . . . Conference held at Michigan State, were "enthusiastically received". Norman R. Olson summarizes them in this article

THE THEME OF THE second annual industrial ventilation conference held at Michigan State College, East Lansing, can perhaps be summarized as follows:

"Adequate industrial ventilation requires (1) that management be sold on the necessity and proper installation of ventilation facilities; (2) proper engineering of the systems; and (3) proper maintenance of existing systems, with complete records."

The conference — held during the week of February 16 — was developed cooperatively by the Division of Industrial Health, Michigan Department of Health and the School of Engineering, Michigan State College. It was enthusiastically received by the 142 people who registered. The group included plant engineers, contractors, consulting engineers, industrial hygienists, and educators — to mention a few of the fields represented.

"Talks, Not Papers" Are Featured

The schedule was intensive and complete from the Monday morning registration until the noon luncheon on Thursday, when L. G. Miller, Dean of Engineering, Michigan State College, presented certificates to the conferees.

"Talks, not papers" (as emphasized by K. E. Robinson, Ventilation Consultant, General Motors Corp.) and demonstrations were presented each morning and afternoon in the auditorium, each followed by class-room sessions. For these sessions the registrants were divided into two groups, beginners and advanced. The beginners spent considerable time in the detailed calculation of typical factory dust collecting systems, with emphasis on the fundamentals of hood and duct design. The advanced class worked out a detailed solution of some dust collecting systems, vapor exhaust systems, and exhaust systems for a paint baking oven, paint spray booth, and an isolated welding operation.

It should be emphasized that, although these operations represent only a few of the many problems found in industry, they are sufficient to teach the proper procedure required in designing any industrial ventilation system. These problems also enabled the students to become acquainted with the Industrial Ven-

tilation Manual, a compilation of recommended practice, which was used throughout the conference. This manual is an invaluable aid in the solution of industrial ventilation problems and may be secured from the Committee on Industrial Ventilation, P. O. Box 453, Lansing, Mich.

Pitot Tube Demonstration Opens First Session

Dean Miller welcomed the group to the conference and introduced the first speaker, W. H. Williamson, Project Engineer, American Wheelabrator and Equipment Corp., who opened the first session with a pitot tube demonstration.

It was revealed at the first conference last year that a great deal of confusion existed concerning the calculation and understanding of fan static pressure. This demonstration was performed at the beginning of this year's conference so that everyone became familiar with the nomenclature to be used throughout the sessions and had an understanding of how total pressures, static pressures and velocity pressures can be determined with a pitot tube.

Actual pitot tube readings were taken in a 7½ in. round duct which was connected to a centrifugal fan. It was pointed out that an approximate average reading could be obtained if the reading at the center of the duct was multiplied by 0.81. The more accurate method, however, is to use the 10 point traverse system, where readings are taken at 10 points in the vertical plane and 10 points in the horizontal plane to obtain an average.

Mr. Robinson delivered the second address of the opening session, his talk being on the results of a model study of general ventilation.

The two movies shown during this talk were highlights of the conference. The first was a demonstration, using titanium tetrachloride smoke, of air flow through various types of hoods which were modified in many ways to illustrate the effect on air flow into and through the hoods. The tests were on model hoods; however, actual conditions were simulated and a vivid demonstration was given of the effectiveness of various hood modifications, such as flanging of the inlet, location of the hood with respect to the smoke source, and use of slot type entrances.

The second movie was a demonstration of air flow in a transparent plastic model of a factory building. Smoke was induced at various locations and air flow was observed when fans in the roof and walls were turned on and off. Various windows were opened and closed to illustrate the resulting air flow. The demonstration emphasized such points as the necessity for make-up air and avoidance of short circuiting.

Air Velocities and Hood Design

Jack Baliff, Senior Industrial Hygiene Engineer, New York Department of Labor, spoke Monday afternoon on velocities — control, slot, and carrying.

The importance of the basic formulas of air flow was emphasized:
1) $Q = AV$ = the basic formula for cfm of air delivered.
2) $V = (2gh)^{\frac{1}{2}}$ or $V = 4000\ (VP)^{\frac{1}{2}}$, where V is in feet per minute and VP (velocity pressure) is in inches of water.
3) $h_f = f\ (L/D)(V^2/2g)$ = friction loss in closed pipe, where f = friction factor, L = length of pipe, and D = diameter of pipe, feet.

The principal consideration, of course, is the fact that the pipe friction varies as the square of the velocity.

The control velocity of air entering a hood is that necessary to stop the particles and turn them around. To do this effectively requires sufficient capture velocity (velocity at the source of the contaminant) and adequate hood design. Particular stress was placed on designing hoods with as great a depth as practically possible, as a mass of air working through a greater distance is capable of stopping and turning more particles.

The most important considerations in maintaining good control and operational economy are:

1) Hood should enclose the contaminant as much as possible.

2) Hood depth should be as great as possible, practically speaking.

3) Face area of hood should be kept to a minimum.

4) A reasonable velocity through face of hood should be used, depending on the contaminant.

For free hanging hoods, if hood opening dimensions are indicated as W = width and L = length:

If W/L is greater than 0.1, the following formula will apply for calculating the cfm of air necessary:-

$Q = V[(X^2 + bA)/b)]$, where b = factor depending on the W/L ratio.

X = distance from hood opening, ft; V = centerline velocity at distance X; A = cross sectional area of the opening.

W/L	b	W/L	b
0.1	0.02	0.6	0.071
0.2	0.037	0.7	0.075
0.3	0.049	0.8	0.078
0.4	0.059	0.9	0.081
0.5	0.065	1.0	0.083

When W/L is less than 0.1, the opening is considered a slot and the following formula applies: $Q = 3.7\ XVL$.

In the past it has often been thought necessary to maintain high slot velocities. Tests have shown, however, that excellent control can be obtained with slot velocities in the neighborhood of 2000 fpm with reasonably good distribution over a slot length of 6 or 7 ft.

When calculating the resistance through this type of hood it is first necessary to calculate the loss through the slot, which equals 1.78 $\times$ VP, where VP = pressure corresponding to the slot velocity. To this must be added the loss through the rest of the hood to the branch duct, which depends on the hood configuration.

The transport velocity required in the ducts is dependent on size, density, shape, the natural tendency of particles to join, to pick up moisture, etc. These factors must all be considered when determining the velocity necessary to keep the particles in suspension.

Monday evening was devoted to a general discussion of problems submitted by registrants.

Congested industrial areas make the disposal of collected materials difficult. One approach to this problem was indicated in a movie. This movie, Power from Waste, showed an installation where suspension burning of kiln dried sawdust from a collecting system was used to produce steam for the plant. The sawdust was blown into the firebox through simple nozzles at velocities of 4500 to 6000 fpm. Tests indicated that 5 lb of steam were produced per pound of sawdust burned.

Good Design Means Operating Economy

Howard Limbacher, of Ingersoll Products Div., President, Western Michigan chapter of the American Society of Heating and Ventilating Engineers, was chairman of the Tuesday sessions. He introduced Roger Browne, Jr., Supervisor, Plant Layout, Cadillac Motor Car Div., who

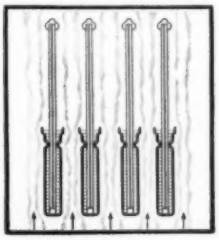
(*Please turn to page* 145)

THE CONVECTOR HUMIDIFIER
doesn't choke even the smallest plenum

Compared to flat-bottom type humidifiers, Maid-O'-Mist Convector Humidifier means

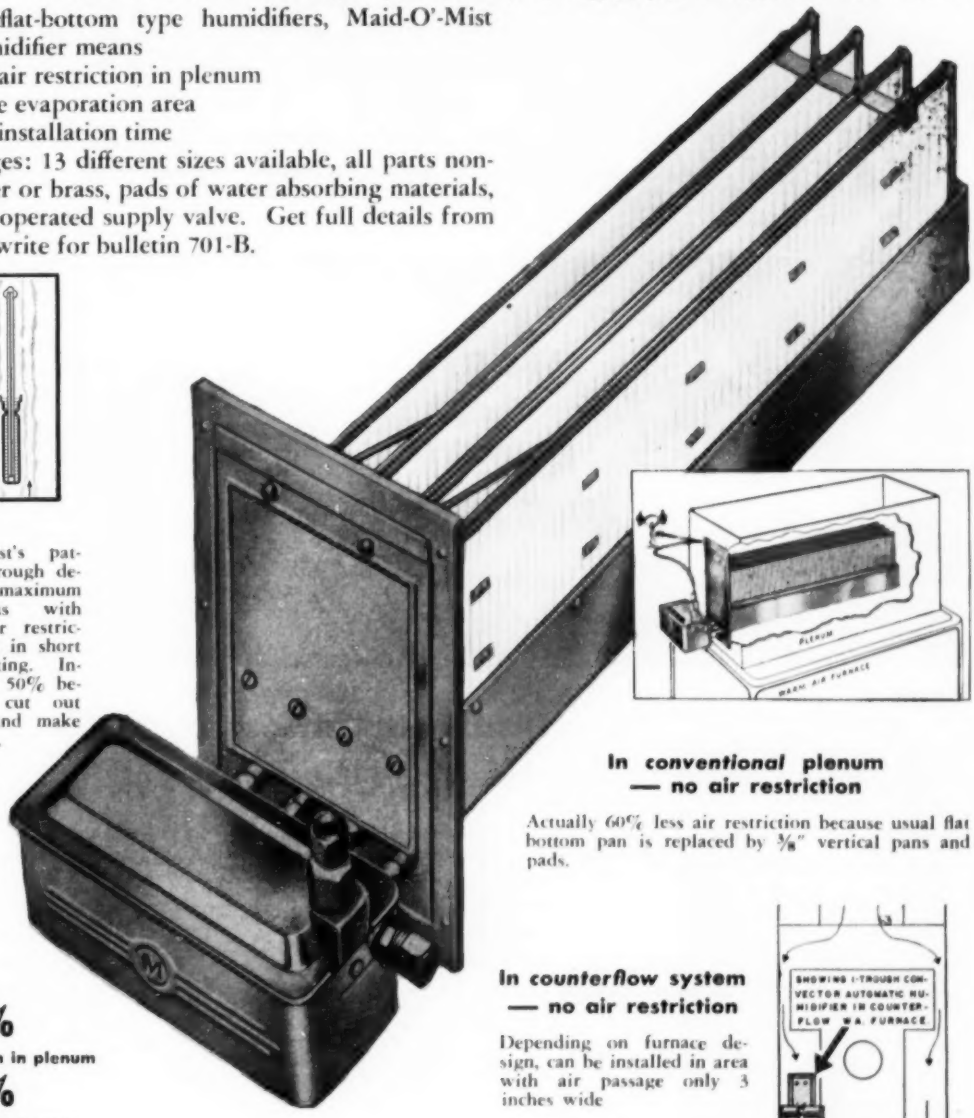
- 60% less air restriction in plenum
- 30% more evaporation area
- 50% less installation time

Other advantages: 13 different sizes available, all parts non-corrosive copper or brass, pads of water absorbing materials, automatic float-operated supply valve. Get full details from your jobber or write for bulletin 701-B.



Exclusive!

Only Maid-O'-Mist's patented individual trough design offers such maximum evaporation areas with such minimum air restriction . . . essential in short cycle modern heating. Installation time cut 50% because you just cut out plenum opening and make water connections.

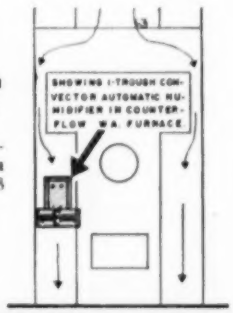


In *conventional* plenum — no air restriction

Actually 60% less air restriction because usual flat bottom pan is replaced by ⅜" vertical pans and pads.

In *counterflow* system — no air restriction

Depending on furnace design, can be installed in area with air passage only 3 inches wide



60%
less air restriction in plenum

30%
more evaporation area

50%
less installation time

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WATER LINE CONTROLS . HEATING SPECIALTIES

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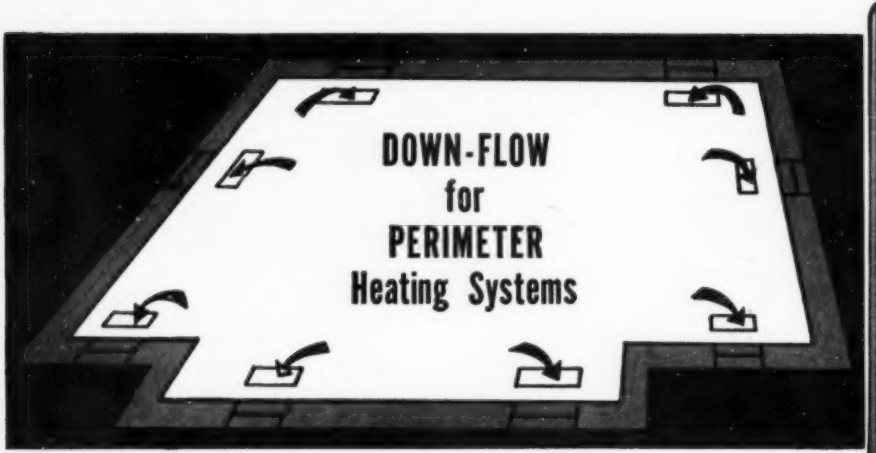
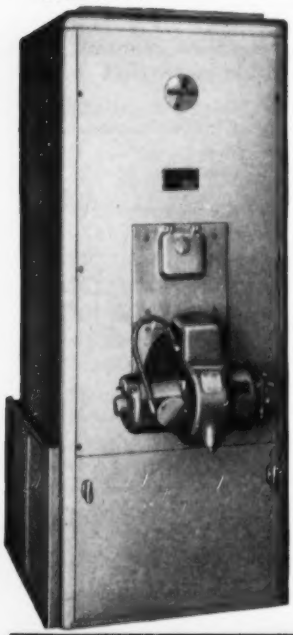
Activated Heat WITH warm air NiAGARA FURNACES



GAS Model 40-80 DFAC DOWN-FLOW

OIL Model 30-90 DVAC HI-BOY



. . . and conventional "up-flow" Hi-Boys . . .

Long noted for dependable and efficient service—supplying maximum heat at minimum cost—Niagara furnaces are fast gaining fame also as maximum profit-makers for heating contractors.

The Niagara line, greatly enlarged to meet all modern residential heating requirements, now includes:

GAS Basement and utility-room models . . . Down-Flow and conventional "up-flow" Hi-Boy units (steel) . . . also the famous Deluxe "Thrifty 50" with the exclusive, efficient Niagara cast-iron heat exchanger—forced air and gravity.

OIL Down-Flow and conventional "up-flow" Hi-Boy models and basement-type forced-air and gravity units (steel).

COAL Complete winter air conditioners and round and square gravity furnaces (cast-iron).

SIZES FOR LARGE, MEDIUM AND SMALL HOMES

For detailed information on the profit opportunity with Niagara, write:

NIAGARA FURNACE DIVISION
The Forest City Foundries Company
2500 West 27th St., Cleveland 13, Ohio

NiAGARA is the word for MAXIMUM HEAT at MINIMUM COST

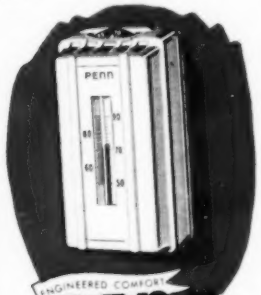
...and we're finally fed up!

You've put up with it, too... coaxing an outmoded heating system all winter long in a vain attempt to get the *steady, even* warmth you need. And during the changeable Spring season, it's worse than ever!

Right now . . . this Spring . . . is get-ready time for next heating season. See your local dealer. Ask him to show you how a *modern* automatic heating system controlled by the *modern* PENN *heat-anticipating* room thermostat stops Hot-n-Cold living. Here's a thermostat that "anticipates" temperature changes *before* your body feels them. Then it "commands" the burner to supply the right amount of heat to *maintain* the temperature level you select for *real heating comfort.*

On your heating system, *be sure* you get PENN Controls and you'll *be sure* of lasting comfort! Remember, PENN costs no more.

Penn Controls, Inc., Goshen, Indiana



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AUTOMATIC CONTROLS

Selected by leading manufacturers for over 30 years

FOR HEATING, REFRIGERATION, AIR CONDITIONING PUMPS, AIR COMPRESSORS, ENGINES, GAS APPLIANCES

SUPPORT

LIKE THIS...

helps *you* sell

BETTER HEAT

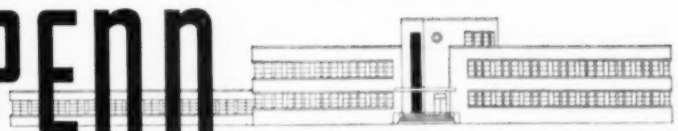
"Right now . . . this Spring . . . is get-ready time for next heating season. See your local dealer."

That's what this action-compelling, timely PENN advertisement is telling and urging your heating prospects to do! Take advantage of this extra sales help. See your prospects now . . . tell them how old-fashioned HOT-n-COLD living is an experience of the past when their heating system is controlled by the famous PENN heat-anticipating thermostat. Use the PENN consumer literature to clinch the sale. Write today for a FREE supply of sales aids.

Remember . . . any type of heating system is better, gives greater comfort when it is equipped with PENN heating controls. **Penn Controls, Inc., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N. Y., U.S.A. In Canada: Penn Controls Limited, Toronto, Ontario.

As advertised in the May issue of AMERICAN HOME... the June issue of BETTER HOMES & GARDENS and the May 11 issue of NEWSWEEK

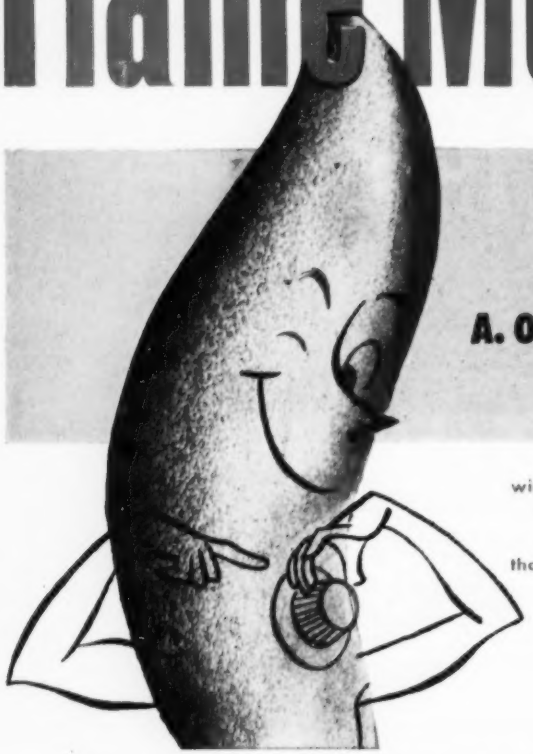
PENN



AUTOMATIC CONTROLS

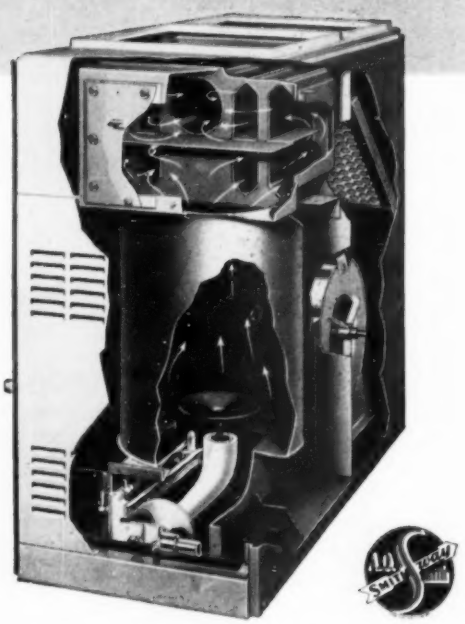
FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Flame Modulation!



Provided only by the A. O. SMITH WINTER AIR CONDITIONER

with the Flame that Tunes Itself



Here's the furnace you've been wanting to sell! The warm-air furnace that automatically compensates for heat losses as they occur *without on-and-off burner cycles!*

It's the only winter air conditioner with a flame that tunes itself continuously to heating needs, the furnace that keeps up with the weather . . . that "thinks for your thermostat"!

Three exclusive components make this kind of furnace possible and provide perfect "LIVING-LEVEL" HEATING. They are: (1) *Magic Heet* Control which continuously measures the rate of heat loss and automatically adjusts input of gas to the (2) *Modu-flame Burner* which provides the precise amount of heat required, and (3) *Duo-Level Blower* Control which automatically varies the velocity of constantly circulating filtered air in accordance with the heat output.

As a result, indoor comfort is kept uniform, constant, regardless of outdoor temperature fluctuations.

In the A. O. Smith Winter Air Conditioner you offer de luxe construction for heavy-duty service and permanence; an all-welded, hi-efficiency heat exchanger with more heating surface; and clean, compact design. Factory assembled, wired, tested and adjusted; ready for quick and easy installation!

For complete information, write A. O. Smith Corporation, Permaglas-Heating Division, Dept. AA-553, Kankakee, Ill.

Nothing else like it on the market!

LIVING-LEVEL HEATING MEANS

More than automatic heat!
More than continuous air circulation!
More than mechanical burner control!
More than electronic temperature control!

Low Boy and High Boy Models are approved by AGA for modulation of gas input from 40,000 to 100,000 Btu/hr.

A.O.Smith

PERMAGLAS-HEATING PRODUCTS

SALES: Atlanta • Chicago 4 • Dallas 2 • Denver 2 • Detroit 21 • Houston 2 • Los Angeles 22 • Midland 5, Texas • Milwaukee 8 • New York 17 • Philadelphia 3 Pittsburgh 19 • San Francisco 4 • Seattle 1 • Springfield, Mass. • Washington 6, D.C.
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International Division: Milwaukee 1
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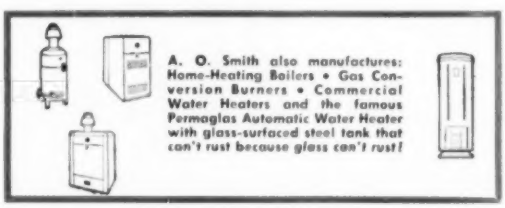

A. O. Smith also manufactures: Home-Heating Boilers • Gas Conversion Burners • Commercial Water Heaters and the famous Permaglas Automatic Water Heater with glass-surfaced steel tank that can't rust because glass can't rust!

Must Know Overhead to Gauge True Profits

N. J. Biddle
Secretary, Michigan Heating and Sheet Metal Assn.

In this last of a series, the author explains why certain items should be included in any tally of overhead costs. He then explains how the dealer can find out if his business is really paying off, and how he can build up an estate over a period of years

INTEREST ON THE CAPITAL invested in the business, rent of property used in the business and owned by the proprietor, earnings of the proprietor for the work or service performed, and depreciation — these are all items of overhead expense. However, there is considerable disagreement about the first three being so included. Many contractors and accountants claim that these cannot be so considered because any income therefrom goes to the owner, and is not deductible as a business expense for income tax purposes. The items will, however, be discussed in the order named, and the reader may draw his own conclusions. The discussion which follows applies to non-incorporated companies (proprietorships and co-partnerships).

Capital investment may be defined as the amount of money or the money plus the value of any materials, tools or equipment with which a contracting business is started, plus any amounts of money which may be fed into the company from time to time either from earnings, surplus or entirely new capital.

For example, suppose that a workman started accumulating the tools and equipment necessary to carry on a contracting business considerably in advance of his actual entry into the field. Either the purchase price or the replacement price should be set up as the value of such items for determining the amount of capital invested. This amount, plus any money put into the business, would be the original capital investment. If additional funds are put into the business from time to time, the capital investment would be increased in each case by the amounts so invested.

If the starting capital amounted to $2500 in machinery or equipment with a like amount of cash, the capital investment would be $5000. If later another $5000 were put into the business, then the capital investment would be $10,000.

For accounting purposes, it is important to know at all times just what the capital investment amounts to. The reasons will become increasingly apparent.

Why is Interest on Capital Considered Overhead?

The question naturally arises, why should the interest on capital investment be considered a proper overhead item when it is not deductible as a business expense for tax purposes?

One very good reason is that the use of capital has value. If a contractor were to borrow his entire capital requirement, the lender would surely be entitled to and would undoubtedly require rent for the use of his money, which is generally termed interest. If the funds with which one contemplated starting a business were invested in good securities, they would bring a return in the form of dividends, or if these funds were loaned to others they would bring in interest. Therefore, it seems logical that the use of money has value, and that its value should be determined and charged to the business in which it is used.

Another reason for charging the business for the use of the money invested is that all business is a risk. There is never any certainty that a business will succeed until it becomes a proven reality. Risk money has always promised returns, and the greater the risk the greater the returns which are generally promised.

The third reason is because it is so very important to know just what is happening in a business; proper accounting, which was defined previously as the complete, accurate systematic recording and proper allocation of every business transaction involving money or value, so demands.

It is most important to know whether the business is actually making a profit or whether any seeming profits are from other sources than the actual conduct of the business. There can be no real profit until all proper business charges have been accounted for. One of these is the interest on invested capital. If a firm were only making a net

profit of 5 or 6 per cent on its investment, then there would be no profit from the business at all. It would be just the amount that could be secured from any good investment or the loan of the funds tied up in the business without all of the effort which is required to carry on a business.

Since the interest on any funds borrowed for the business from time to time are legitimate, tax deductible, overhead charges, there seems no logical reason why an overhead charge should not be made for interest on invested capital. The only reason it is not deductible for income tax purposes is because it goes into the same pocket that any actual earnings of the company would go into.

How Owner's Property and Services Should be Treated

If the proprietor of a business requiring housing of some kind did not own a building suitable for his business then he would have to rent one. Rent would then surely be a proper overhead charge, and could be deducted as a business expense for tax purposes. If this property were let out to another party, the owner would require rent for its use. Certainly a part of the income which accrues to a company owning the property used in the business comes from the use of such property, and there seems no good reason why the going rental for like property in a similar neighborhood, used for similar purposes, should not be charged as a part of the overhead expense of such a company.

Likewise, if the owner of a business spent no time in its service, he would have to hire all of the work to be done by others, and there would be no question of charging the cost of all non-productive (administrative, etc.) work as a proper overhead charge. All direct job labor, such as fabricating parts, would, of course, be charged to jobs as a part of the job cost.

If the owner of a business were to quit and go to work for another, he would certainly expect to be paid. If no pay were forthcoming, then other employment would be speedily sought. If this person put in as long hours and did all of the things he formerly had done in his own business, he would expect considerably above the normal daily pay. If it were not forthcoming he would stop the extra work or quit.

It is the firm belief of this writer that the owner of a business should be paid for every service he performs at the going rate for such service. If he spends part of his time as a workman or a foreman, that part of his time should be paid for at the journeyman's or foreman's rate. His estimating service, selling, collecting, accounting, and all other services he performs, including janitoring, should be paid at the proper rate. Of course, the pay for his services cannot be deducted as a business expense for tax purposes, but that makes little difference. He spends all of his time working for his company, and should properly charge it either as overhead or as direct job labor, depending on whether it is administrative — office work (called "non-productive") or actual shop work.

He should either keep a time book on himself, or fill out time cards for each phase of his work, just as he would require of any other worker in his business. Then, and only then, will he know what his services are costing him and the company.

Depreciation Also a Factor

There is no tax question in regard to depreciation. It is a legitimate overhead expense for all purposes.

All items of equipment and machinery wear out. Each has a normal useful life when not rendered obsolete and uneconomical by new inventions. This normal life can be ascertained from the manufacturer or from many other sources, or it can be approximated by the contractor on the basis of past experience.

All successful companies set up reserves for depreciation so that when the normal life of the tool or machine has passed, the money has been accumulated and is ready for the purchase of new equipment. Take, for instance, a truck which may cost $3000. It can be depreciated in four years at the rate of $750 for each year. If this money is set aside periodically, there is the $3000 ready and waiting for the purchase of a new truck at the end of four years, and the company avoids having to pay the excessive interest rates for time finance. That is good business.

What are True Profits?

It is only after the items enumerated above have been paid that there can be any true profit from a business operation. Profit means *that amount of money remaining after all business expenses have been paid.*

Until all of the proper expenses of running a business have been paid, any improvement or increase in company finances is due to causes other than the business operation. Many contractors show profit and loss statements which reflect substantial earnings, but they charge none of the above items as overhead expense. Consequently, their figures are useless from the point of getting a true picture of operating costs. To get a true picture of a business operation, every transaction involving money or value, regardless of the amount, must be accurately accounted for and properly allocated. There is no other way to get a true perspective of the success, or lack of it, of a business operation, and that is exactly the reason why so many contractors in all phases of construction grind through the years without success.

Many companies do make a profit but its amount is not discernible because of improper accounting. Contractors must avail themselves of a good accounting system which properly reflects their entire operation, shows the true net profits of the business, the profits from ownership, from capital, or the owner's personal services. Then, and only then, will the contractor truly know what he is doing.

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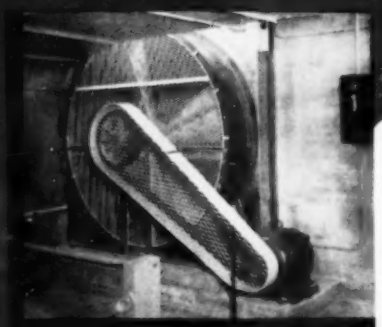
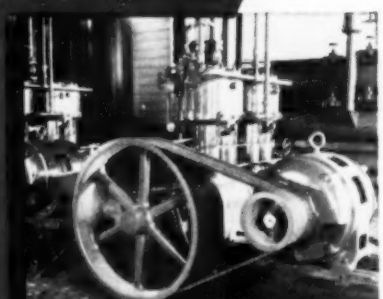


Century motor driving a large fan.

WHY Century MOTORIZED EQUIPMENT KEEPS YOUR CUSTOMERS *SATISFIED...*

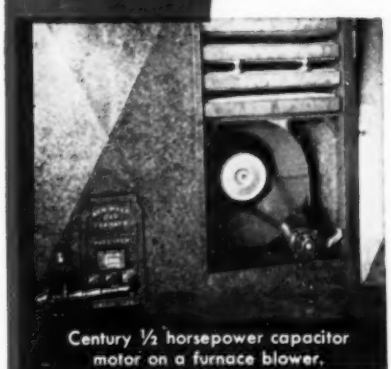


Two 100 horsepower Century motors driving refrigeration compressors.

The motor specifications—where skillfully selected—to assure the TOP PERFORMANCE and DEPENDABLE QUIET SERVICE that is built into each class of equipment.

Refrigeration compressors require one combination of operating characteristics and specifications—fans and blowers another combination—various types of heating equipment still another.

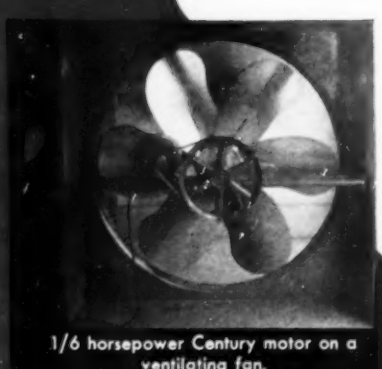
In over 50 years, Century has developed a wide line of types of motors with literally hundreds of specifications to choose from. It is easy to ENGINEER YOUR PRODUCT PERFORMANCE—THROUGH SKILLFUL MOTOR APPLICATION.



Century ½ horsepower capacitor motor on a furnace blower.

If you have motor service problems, phone or write to any of Century's 28 District offices regarding Century's national network of service stations—the motor exchange plan will serve you whether your motors are in or out of warranty.

Specify Century Motorized Equipment—get top equipment performance—dependable quiet service—keep your customers satisfied.



1/6 horsepower Century motor on a ventilating fan.

CENTURY ELECTRIC COMPANY
1806 Pine Street • St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

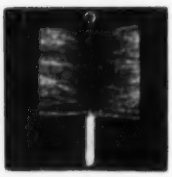
Century C MOTORS

SCHAEFER ...Most Complete Line of Brushes

FOR PLUMBERS, FURNACEMEN, HEATING CONTRACTORS, SERVICE ENGINEERS

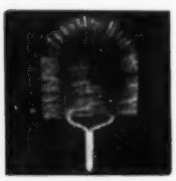
You'll find a brush for every flue and boiler need in the Schaefer line. And it will be the *correct* brush, designed for a specific job and precision manufactured to do that job well.

"Silver Brite" rustproof spring steel wire is an example of quality detail that Schaefer designers have built into Schaefer Brushes to give you more cleaning efficiency and longer brush life than any other brush can provide.



SCHAEFER Rectangular Flue Brushes

No. 8-415—2"x4"x4-½"
No. 8-416—3"x5"x4-½"

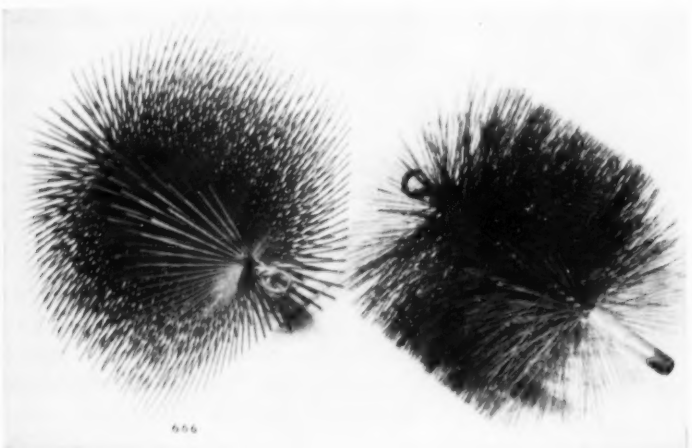


SCHAEFER Boiler Brushes

No. 8-393—1-¾"x4"x5-½"
No. 8-394—2-½"x6"x6-½"
No. 8-395—3-½"x6"x6-½"

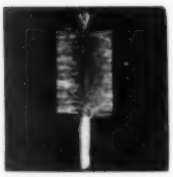
SCHAEFER Boiler Brushes

No. 8-390—1-⅝"x4"x4-½"
No. 8-391—2-½"x6"x4-½"
No. 8-392—3-½"x6-⅝"x4-½"



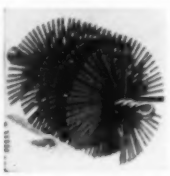
SCHAEFER Chimney Cleaning Brushes
No. 666—6", 7", 8", 10" and 12" square. Made of Flat Tempered Steel Wire.

SCHAEFER Chimney Cleaning Brushes
No. 66—6", 7", 8", 10" and 12" dia. round style of Black Tempered Brush Wire.



SCHAEFER Single and Double Spiral Flue Brushes

No. 8-432—Single Spiral—1" to 4" dia.
No. 8-433—Double Spiral—1" to 4" dia.
No. 8-434—For Small Flues, ½" to 1" dia.



SCHAEFER Round Flue Brushes of Single Spiral, Flat Steel Wire

No. 430—1" to 4" dia.

SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral.

No. 420—2"x3-¼"x4"
No. 422—1-⅜"x3-¼"x4"
No. 423—2"x3-¾"x5"
No. 424—2-¾"x4-½"x6"

SCHAEFER BRUSHES —MILWAUKEE— Look for the Schaefer Trademark — it's on every Schaefer Brush and Container. Write for catalog.

BUY SCHAEFER—IT'S SAFER SCHAEFER BRUSH MFG. CO.

117 W. WALKER STREET MILWAUKEE 4, WISCONSIN

SCHAEFER Boiler Brushes

No. 8-399—2"x4"x6"
No. 8-400—2-½"x4-½"x6"
No. 8-401—3"x5"x6"

SCHAEFER Handy Wire Brush

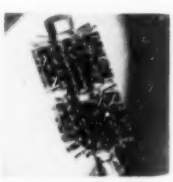
No. 816—For roughing, soldering, etc. 6" long, tempered steel wire trimmed 1-½".

Tin Handle Acid or Dope Brushes

Selected grade bristles in tin ferrule. Width, ⅜" x½", ⅝".

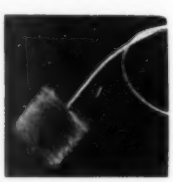
SCHAEFER Copper Tube Fitting Brushes

Clean fittings faster, easier, safer. In 9 sizes for I.D. or Nominal Fitting Sizes from ¼" to 2".



SCHAEFER Improved Expansion Flue Brush

Made of Flat Steel Wire with metal guards. Sizes: 1-½" to 8" diameter.



SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel

No. 8-442—3", 4", 4-½", 5" with 5 ft handle.

The New No. 1356

U. S. Diffuser Sidewall Register

For Perimeter and Small-Pipe Systems

Single Valve—Sets Against Sidewall—Used with Standard Stackhead

Diffuses the warm air-stream in a widespread range that blankets the windows and cold outside walls and directs the air-stream sufficiently away from the walls to avoid discoloration of curtains and walls.

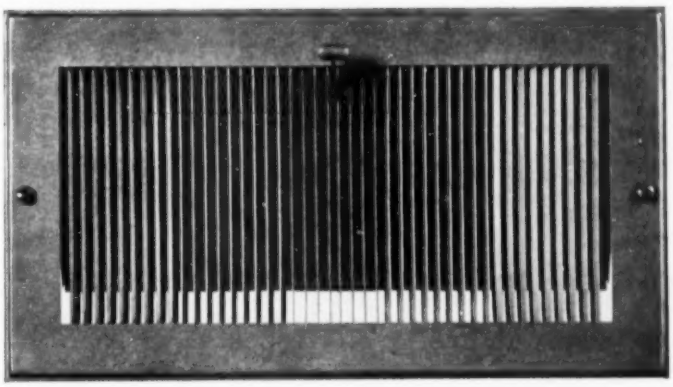
The No. 1356 U.S. Diffuser Sidewall Register

Develops Magic Efficiency by Its GRADUATED VERTICAL BARS.

IT SPREADS the AIR-STREAM.

IT DEVELOPS MOST COMPLETE GLASS and OUTSIDE WALL COVERAGE with the LOWEST POSSIBLE RESISTANCE.

Ask Your Jobber to Ship You A TRIAL ORDER and You Will Be Convinced—A FULL LINE—With Nos. 132¼ and 133¾ BASE DIFFUSER REGISTER to Match. Single Valve with SET-LOCKS for Balancing Job at the Register. This is the LAST WORD in PERFECT EFFICIENT DIFFUSER SIDEWALL REGISTER DEVELOPMENT.



Below is a true Photo of a Smoke Test of the No. 1356 Made in our Testing Laboratory showing the very correct diffusion spread of air-stream.

The No. 1356 U. S. DIFFUSER SIDEWALL is made with a SINGLE VALVE with SET-LOCK.

It is a PERFECT PIECE of ENGINEERING—PLAIN-PLEASING and Performs the DIFFUSION JOB without enforcing the Use of Unattractive Designs. Study this Diffusion-Spread Test. THIS No. 1356 REALLY DOES IT. Less Resistance—Less Fan Load. Notice the Following Complete List of Sizes.

Size of Register	Size of Stack Boot	Size of Round Pipe
10" x 5"	2¼" x 10"	4"
12" x 5"	2¼" x 12"	4" or 4½"
14" x 5"	2¼" x 14"	4½" or 5"
10" x 6"	3¼" x 10"	6"
12" x 6"	3¼" x 12"	6" or 7"
14" x 6"	3¼" x 14"	6", 7", or 8"

"READ ALL ABOUT IT" in our New No. 53 General Catalog — NOW READY — NEW PERIMETER LINES — NEW COMMERCIAL LINES — NEW CEILING DAMPERS — "NEW EVERYTHING"

Manufacturers of "GREATEST LINES on EARTH"

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

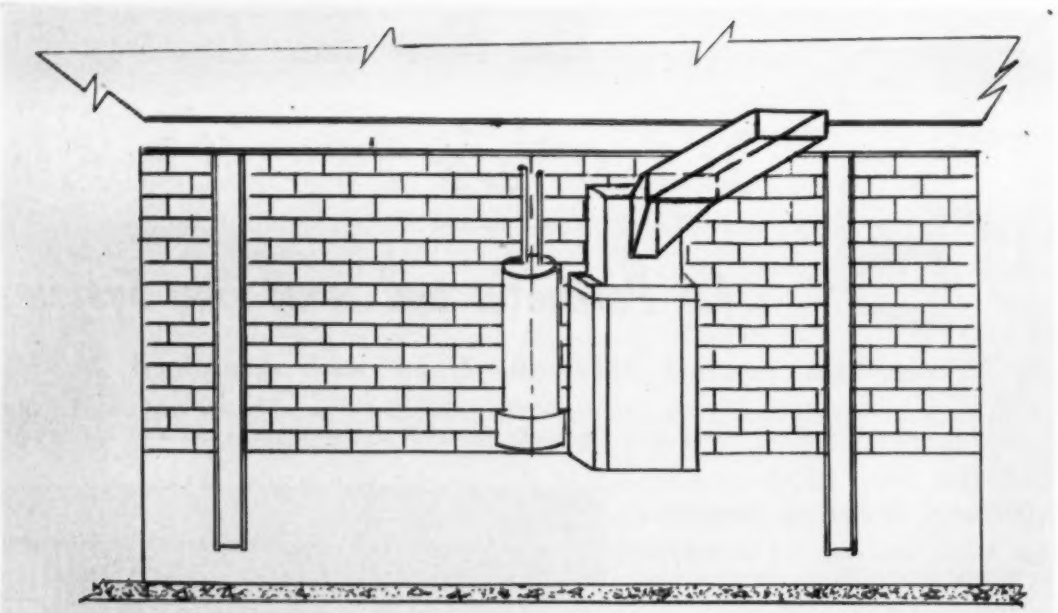


FIG. 1 — CENTER REVERSIBLE OFFSET fitting is used to simplify a direct take-off from a furnace plenum

Simplified Method of Developing a Reversible Offset Fitting

Streamlining a sheet metal fitting reduces air flow resistance and adds to the attractiveness of exposed duct systems

IN THE HEATING FIELD today, the forced warm air furnace has largely replaced the gravity furnace which was so widely used 25 years ago. This permits the use of ducts smaller than those required for gravity circulation. The smaller ducts may be installed tight against the basement ceiling joists, thus permitting maximum head room in the basement area.

This change in duct construction has transformed the basement in the home from a dingy, dusty area into an attractive recreation area — a point that can be stressed by the heating contractor whenever he is called in to make repairs on old heating systems.

The replacement of the spider-like duct system of the

(*Please turn to page* 135)

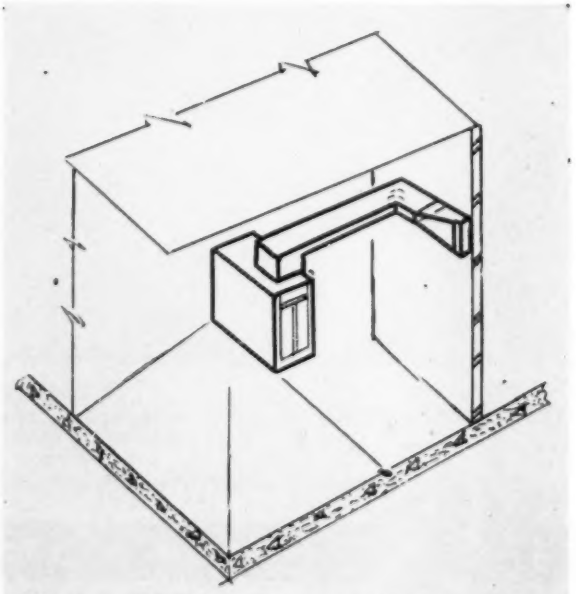


FIG. 2 — ANOTHER USE of the reversible offset fitting when it is desired to maintain two sides straight

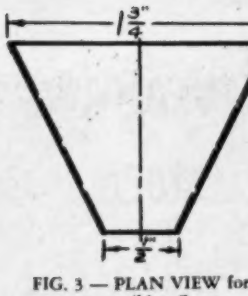


FIG. 3 — PLAN VIEW for center reversible offset

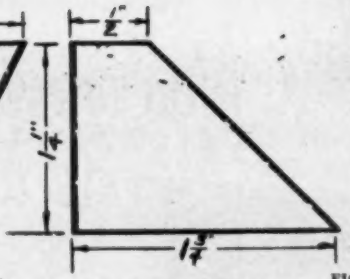
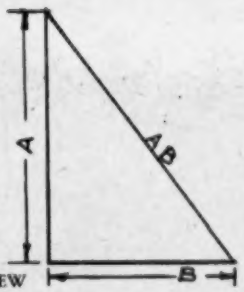


FIG. 4 — END VIEW for center reversible offset

FIG. 7 — PICTORIAL VIEW of the center reversible offset fitting



DEVELOPMENT of the true length line for Fig. 6

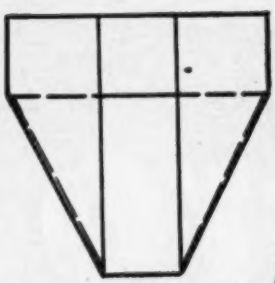


FIG. 5 — FRONT VIEW for center reversible offset

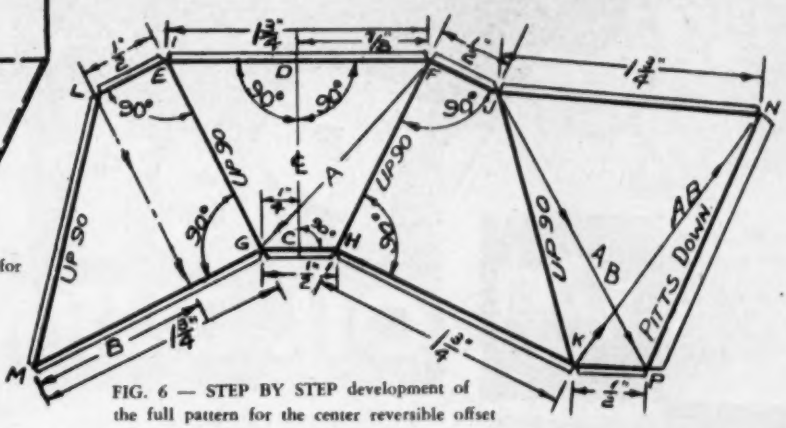


FIG. 6 — STEP BY STEP development of the full pattern for the center reversible offset

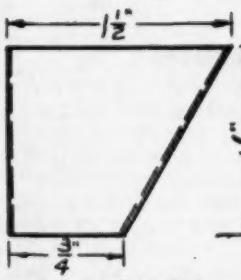


FIG. 8 — PLAN VIEW for two straight sides reversible offset

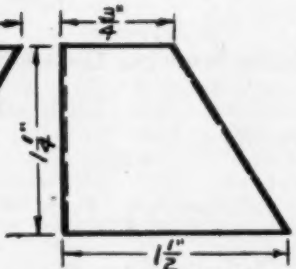


FIG. 9 — END VIEW for two straight sides reversible offset

FIG. 12 — PICTORIAL VIEW of the reversible offset fitting with two straight sides

DEVELOPMENT OF the true length lines for Fig. 11

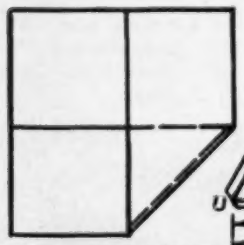


FIG. 10 — FRONT VIEW for two straight sides reversible offset

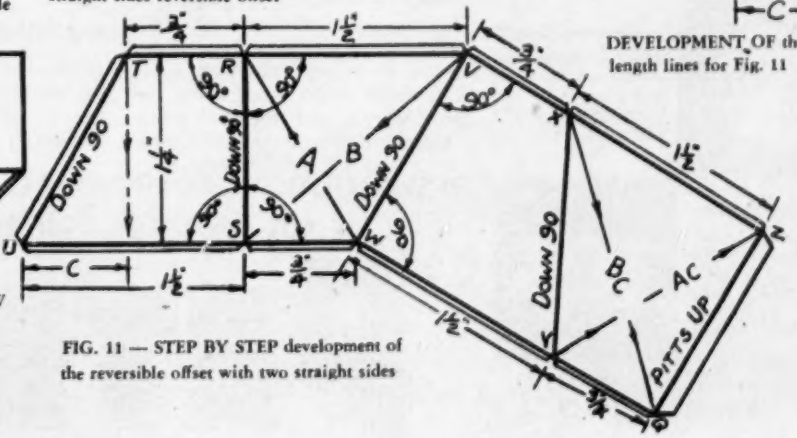


FIG. 11 — STEP BY STEP development of the reversible offset with two straight sides

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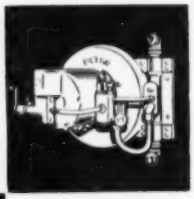

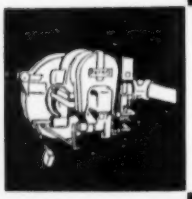

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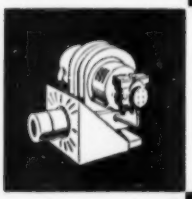

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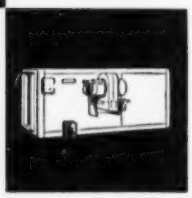

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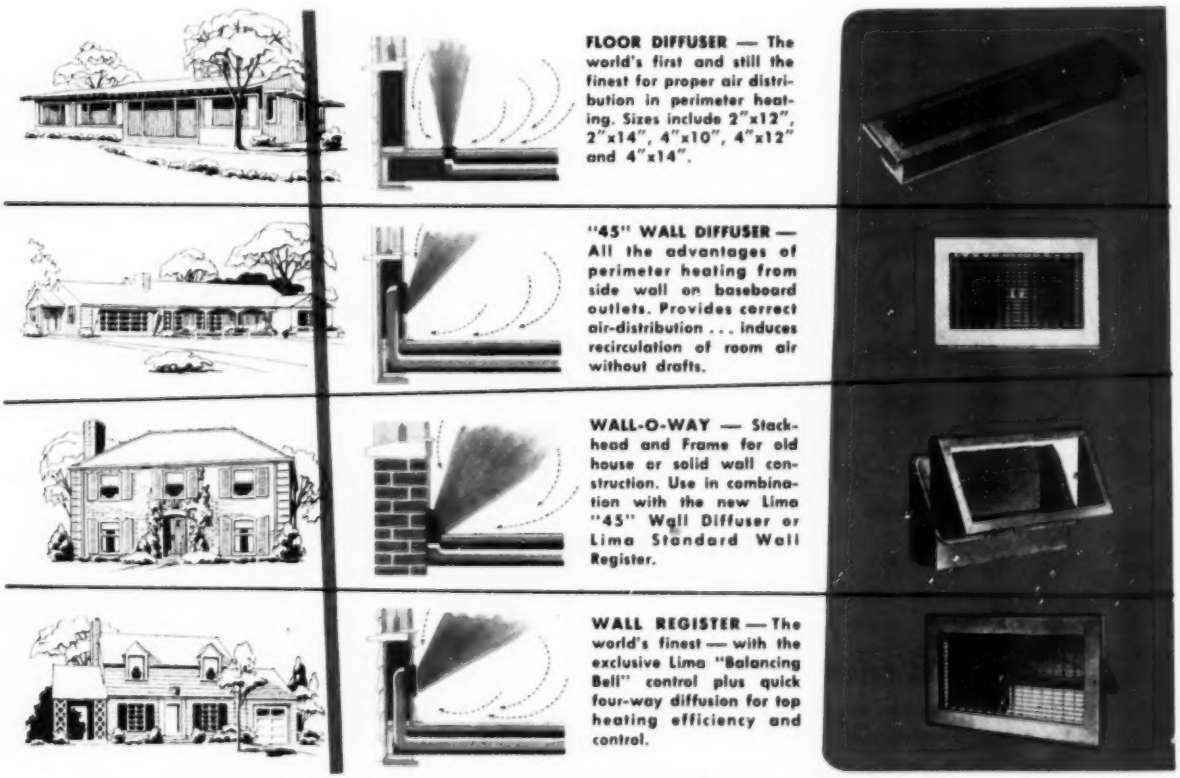

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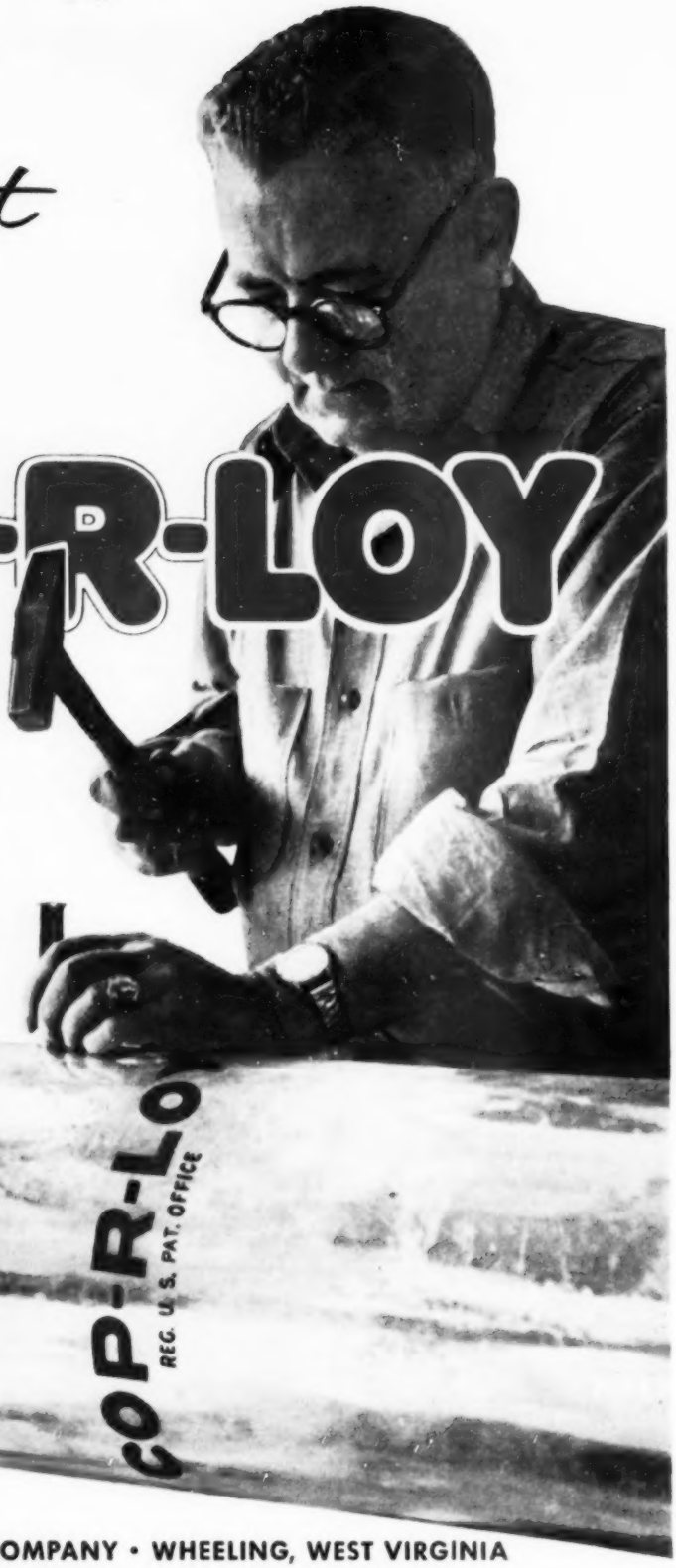

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YOUR BUSINESS AND THE LAW

Installed Equipment Can Become Realty

Albert W. Gray

To decide whether installed heating and cooling equipment is real or personal property may be difficult. To insure himself against loss in the conditional sale of such installations, the contractor must file — in most states — a record of any such sale or chattel mortgage within a stipulated time

IN A TWO and a half story frame dwelling, air conditioning and heating equipment was installed under a conditional sale contract. The agreement provided that title to this equipment should not pass to the buyer but should remain in the seller until the agreed price was fully paid in cash. "Said equipment shall remain strictly personal property and nothing shall prevent the seller from removing same, or so much of same as the seller in his discretion may determine, from any premises to which it may be attached upon any breach of this contract," it was stated.

It was provided further, however, that all house wiring, ducts and piping installed by the seller and embedded in the walls, floors or ceilings, should become a part of the building and not be considered any part of the property to which title had been retained by the seller.

The equipment to which title was retained was a summer cooling package with coils and condensing unit, and a furnace with an oil burner, blower, blower motor and filter attachments, and electrical control attachments. The cooling package, burner, furnace, fuel tank and blower, with the blower motor and filter, were not attached to the building, merely resting on pedestals on the basement floor. The furnace was, however, connected to the supply and return ducts, and to the chimney, by removable connections.

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser".

Recorded Notice Required

A statute in that state reads, "No conditional sale of heating apparatus, plumbing goods, ranges, buildings or wood or metal structures of a class commonly known as portable or sectional buildings, wrought into or attached to real estate, shall be valid against any mortgagee, purchaser or grantee unless not later than ten days after the delivery thereof of such personal property a notice is recorded."

No such notice of this conditional sale contract was recorded. Three months after this installation had been completed the owner mortgaged the land and building for $10,000. The mortgagee saw this equipment, but understood it was the property of the owner of the building.

Later when the contractor who had installed this equipment under this conditional sale agreement was not paid, suit was brought for possession of the air conditioning and heating system under the provisions of this contract between the owner and the contractor.

The defense to the action was that this conditional sale agreement had not been recorded as required by the statute, was not binding on the mortgagee, and that as a consequence, no claim under that agreement to the possession of the equipment was enforceable by the contractor since the equipment by virtue of its installation and attachment to the building had become a part of the house and land.

Distinguish Between Fixtures and Chattels

Two earlier decisions in the state sharply distinguished between property that by its very nature could not become part of the realty as a fixture and, on the other hand, property that by its installation, was, in the words of the statute, "wrought in or attached to the real estate" and so became a part of it.

In the earlier of these two cases, relied upon by this contractor in his effort to recover his air conditioning equipment, the court had said of weaving machines, fastened by lag screws to a factory floor of a worsted mill (each machine weighing from 2800 to 3000 pounds):

"It properly could not have been ruled that the machines had been so fixed to the real estate or to other chattels which were to be treated as real estate that they had lost their identity or had become incapable of removal without material injury to themselves or to the building to which they were attached. Nor could it

have been ruled that they are not to be treated as real estate but were chattels." Therefore, the question of whether or not as a matter of law the machines were a part of the building became one of fact, to be determined by a jury.

In other words, under the contention of the contractor, the character of the heating and air conditioning equipment involved in this instance was solely a question of the intent of the parties to the conditional sale contract.

The later decision by which the contractor sought to support his effort to recover his property involved an oil storage tank and burner installed in a dwelling. Referring to the phrase of the statute, "wrought into or attached to real estate," as characterizing the transformation of personal to real property by installation in a building, the court said in this decision,

"We think the word 'attached' means something more than annexed to the realty by such tenuous connections as were used here. There must be something in the connection to indicate a bonding intended to secure permanent rather than temporary relationship between realty and the article in question.

"We find no decision that holds that chattels which have never lost their character as personal property can be held against a conditional vendor by mortgagees, purchasers or grantees of real estate where they have been placed unless they have been wrought into the realty or attached to it in some manner intended to be permanent."

Contractor Denied Right to Repossess

The interpretation made by the state's supreme court of these two earlier decisions and the decision of the court (in the face of these authorities) denying to the contractor in this recent case the right to repossess the air conditioning and heating system, holds an emphatic warning to every contractor in the trade in the installation of equipment under a conditional sale contract.

"The determinative question remains," said the court in conclusion, "whether the heating apparatus here involved is attached to the real estate in question within the meaning of the statute. We think that, by virtue of the numerous connections between the unit and the real estate, it must be found that the unit was attached to the real estate within the meaning of the statute.

"The statute by its terms refers to articles of personal property that remain personal property if they are 'attached' to real estate. The central heating plant of a dwelling house is not a piece of furniture. Successive tenants do not bring it with them when they become occupants nor take it away with them when they cease to occupy the dwelling. It remains and, in the ordinary course of events, performs its function of heating until it wears out or is otherwise inefficient or useless."

Contractor Protects Himself by Filing Record

The court here injected a comment on circumstances under which a contractor who has failed to record or file his contract and follow the mandates of the statutes of the state in which the equipment is installed, seals his own fate in the disappearance of security for his debt and the transformation of his air conditioning and heating equipment into real estate.

"The prospective purchaser or mortgagee of real estate, in the absence of the notice required to be recorded under the terms of the statute, could reasonably expect that it was so attached to the real estate as to be a constituent part of it. Its presence has a distinct relation to the value of the premises for the purpose of sale or mortgage. The legislature in enacting the statute must be taken to have known the ordinary methods employed in the installation of heating apparatus. If the unit in the present case can be found not to be attached to the real estate within the meaning of the statute, it is difficult to conceive a case where a heating apparatus of a central heating type could be said to be within the terms of the statute."

In most (if not all) of the states statutes have been enacted substantially similar to this law requiring the filing or recording of a conditional sale contract for the protection of the contractor's title and right to the repossession of his equipment.

Strict conformity to the requirements of the statute of the state in which the real estate is located is in every instance the most certain method by which a contractor can hold his title to equipment he has installed when the building and land are mortgaged or sold.

Trade Fixtures Not Realty

The uncertainty surrounding this change in the character of heating and air conditioning equipment from personal to real property becomes even more confusing upon the injection of a further factor peculiar to such installations as are classified as trade fixtures.

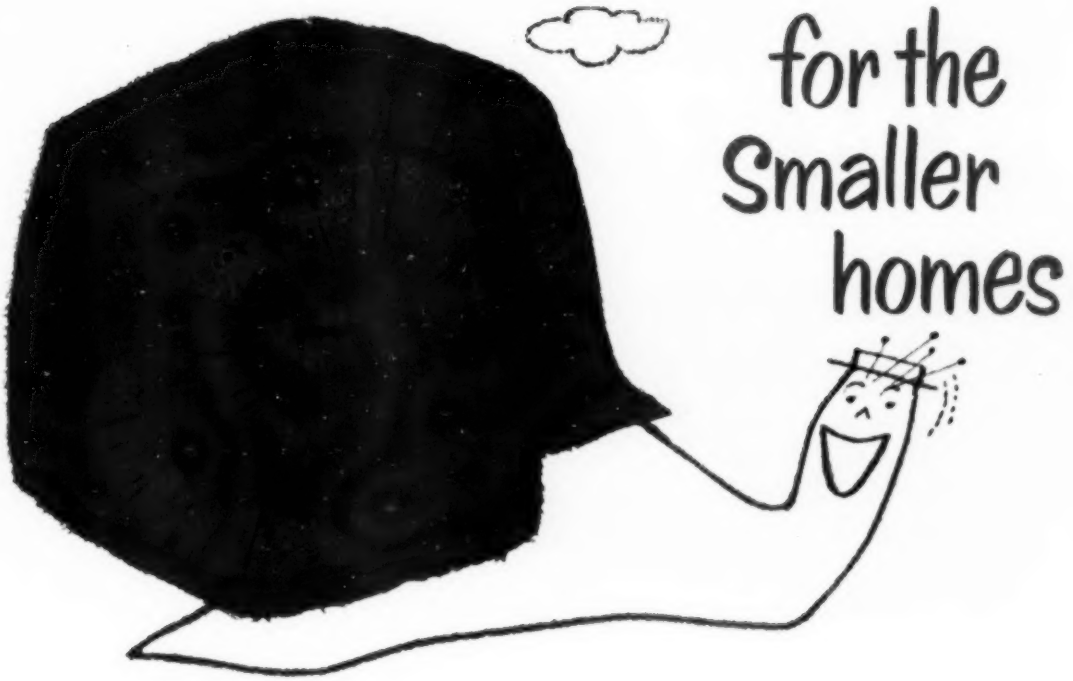
An automobile painter, plying his trade in one state, occupied an old frame building. The building, before his tenancy, had been unoccupied for several years, was badly in need of repairs, and was equipped with no heating facilities. As part of the equipment for his work, he installed a furnace for drying, used the furnace for approximately three years, and then vacated the building. The owner, however, refused to permit the removal of the furnace, contending it had become a part of the building.

Suit was brought by the painter against the building owner on the claim that the heater was a trade fixture and not a part of the building or real estate but remained the property of this tenant when he vacated the premises.

In its determination of the controversy the court said, "The heating installations were trade fixtures that the tenant should have been permitted to remove from the premises. The fact is that the tenant did not intend that the installations made while he was a tenant were to enrich the freehold by becoming a part of the building but placed them there solely for the purposes of trade.

"The intent of the party making the annexation is the

(*Please turn to page* 140)



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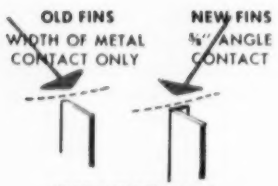

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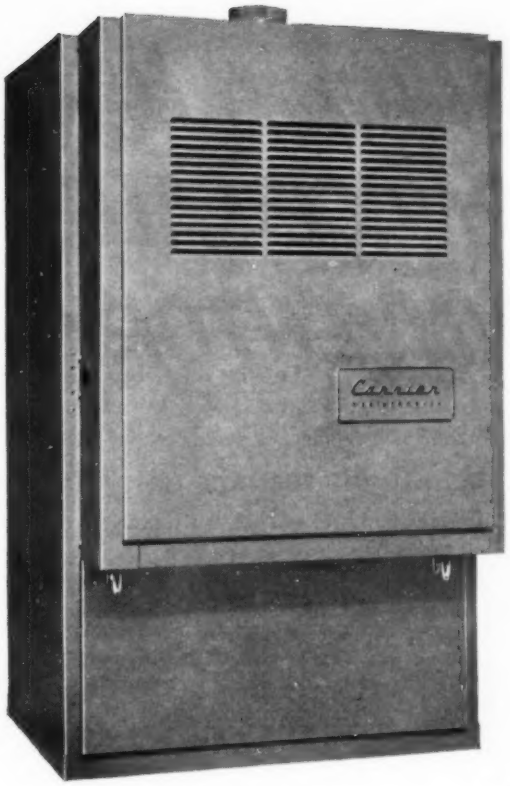

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CONVECTION-PANEL —

(Continued from page 67)

The effect of solar heating can be observed in the readings for the living room, which was provided with a large glass exposure on the south wall. At 12:25 p.m. and 2:50 p.m., the air temperatures at the ceiling were from 3 F to 5 F higher than during morning and evening hours.

The temperatures observed at the breathing level and floor level are somewhat misleading, since the temperature measuring instruments were exposed to direct solar radiation. The over-runs in room-air temperature in the living room were not observed in the recreation room, which had a north exposure. The over-run in the living room air temperature was not as serious as in the installation previously described, probably because of the smaller heat storage in the floor slab as a result of lower slab temperature required, the introduction of a sizable amount of outdoor air by ventilation, and practically continuous air circulation which mixed the air in the rooms.

Conclusions Based on Experiment

In many respects the experiences of this enterprising builder show a consistent and steady approach towards an "ideal" system. In earlier homes, he had incorporated floor panel systems of the closed type, in which the floor panel consisted of massive concrete slabs. These were found to have a slow temperature response, and when combined with houses having solar orientation windows, were found to be extremely sluggish in temperature control and to have large temperature over-runs in room air temperature. The builder found that bleeding air into the rooms from the subfloor panel improved conditions somewhat. The final arrangement described in this article, in which a true panel-convection principle was utilized, was based on the idea of reducing the concrete mass in the floor and of providing a lower slab temperature. Furthermore, the builder was aware of the desirability of overcoming the natural flow of cool air from the window surfaces by a counter-current of warm air. Finally, the builder was also aware of the need for positive introduction of fresh air to minimize odors and to obtain air freshness in a structure which was tight and had numerous fixed sashes.

It is apparent that the house which was constructed by Sloan was of the deluxe type. The main drawback to the heating system as installed was that the construction costs of the floor would be too great for more modest structures. The principle of operation, however, was sound, and the results obtained were consistent with those from similar installations of panel-convection systems. The obvious next step for the industry consisted of developing a heating system which embodied part or all of the following features:

a) Incorporation of heating ducts in the floor slab
b) Provision for some amount of panel heating
c) Utilization of full convection effects near the windows and cold walls
d) Reduction of the cost of floor slab preparation

In the next article a survey of field practices and some developments along these lines will be reported.

A-C PAYS ITS WAY —

(Continued from page 72)

is the cost of drapes, blinds, awnings, etc. Savings on windows are estimated at $650.

In addition, with air conditioning, a number of other costly features can be eliminated: the fireplace ($600 savings); the breezeway or porch, which complicates the roof, ($750); space heaters and floor furnace ($225); the attic fan ($150); and the patio and porch and patio furniture ($300).

Therefore, according to the figures compiled by the association, a total saving of $3925 could be realized by specialized planning. Prices quoted in the campaign were based on homes in the $12,500 price range, and on current building prices in the Fort Worth area.

Campaign a Joint Effort

The entire membership of the Fort Worth Air Conditioning Association voted to undertake the campaign as a joint effort, and funds were raised by a special assessment of association members. All advertisements were given the prestige of the association name and carried the names of individual association members.

In the initial preparation of the proposed campaign, all available trade literature and special studies made by utility companies regarding current and future trends in the air conditioning field were accumulated. This information was worked into an effective presentation and submitted to the Air Conditioning Association and then in turn to allied groups of architects, builders, utility companies and financing institutions.

After special presentations of the program were made to members and key employees, the program was submitted for the consideration of executives of allied businesses. A special luncheon was arranged for executives at the policy-making level, and the association's plans were presented to them. The program was received with enthusiasm. Many companies joined the promotion to the extent of including residential air conditioning advertising in their own advertising schedules.

Concurrent with the speeches, association-sponsored newspaper ads appeared in the local papers and transcribed "spot" announcements were aired over local radio stations. These were tied to special promotion campaigns by the local air conditioning dealers and utility companies, who planned their individual ads and window displays around the information supplied to the local dealers by the association.

The complete program was conceived and developed by W. I. Spitler, president, Air Accessories, Inc., and John H. Ericson, account executive, Parker Willson Advertising, both of Fort Worth.

Promote Warm Air Heating in Cook County

THE AIR CONDITIONING Contractors Alliance, Chicago, held a dinner and dance on May 2, at the Edgewater Beach Hotel, to raise funds for advertising and promoting better warm air heating in Cook County, and to honor its 12 past presidents. Over 600 people attended the function. Officers of the organization are Robert P. Johnsen, Atomatic, Inc., president; Barney Sanders, Sanders Heating Co., vice president; and Hamlin Petty, secretary. Members of the committee on arrangements for the dinner-dance were Mr. Sanders, chairman, and Harry Press, Larry Ingham, Al Vokaty, Joe Kuta, and Howard Nelson.

Convention Committee Meets at Savannah

OFFICERS OF THE ROOFING and Sheet Metal Contractors Association of Georgia recently met with the Savannah convention committee to discuss plans for the forthcoming convention to be held June 11 to 13 at the General Oglethorpe Hotel, Savannah. W. M. Jones, Sr., president of the association, said that events scheduled include a roofing forum, under the direction of Marvin Kelly, Jr.; a sheet metal forum, under I. C. Mock; and a heating and air conditioning forum, under the direction of J. Welch. Hugh Jenkins, chairman of the committee, stated that he had appointed John Kenny and Aaron Newman as a committee to arrange a roofing plant tour.

Indiana Association Suggests Publicity Method

A RECENT BULLETIN from the Sheet Metal and Warm Air Heating Contractors' Association of Indiana suggests that members request their local newspapers to publish an item in the building pages explaining to the prospective home owner the advantages of installing a heating system that can later be adapted to include summer cooling. By installing a heating system of the warm air type, the bulletin points out, when the home owner is ready to add summer cooling all he need do is install a summer air conditioner next to his furnace and connect it to the same air distribution system.

Hammond Group Honors Secretary

THE ASSOCIATED Air Conditioning and Sheet Metal Contractors of Hammond, Ind., recently met at Vogel's Fish House to honor A. R. Harris, who has served as secretary of the group for the past 25 years.

Coming Events

May 20-22 — Gas Appliance Manufacturers Association, Annual Meeting. White Sulphur Springs, W. Va. G. D. Lyford, Program Chairman, 60 E. 42nd St., New York 17.

June 2-5 — Oil Heat Institute of New England, Eastern Biennial Exposition of Oil Heat. Hotel Statler, Boston. Thomas G. Colter, Chairman, 1953 Exposition, 839 Beacon St., Boston 15.

June 11-13 — Roofing and Sheet Metal Contractors' Association of Georgia, Annual Summer Convention. General Oglethorpe Hotel, Savannah, Ga. B. L. Neblitt, Secretary, P.O. Box 1196, Augusta.

June 17-19 — Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, Annual Convention. Hotel Lawrence, Erie, Pa. E. W. Liebermann, Secretary, Ambridge, Pa.

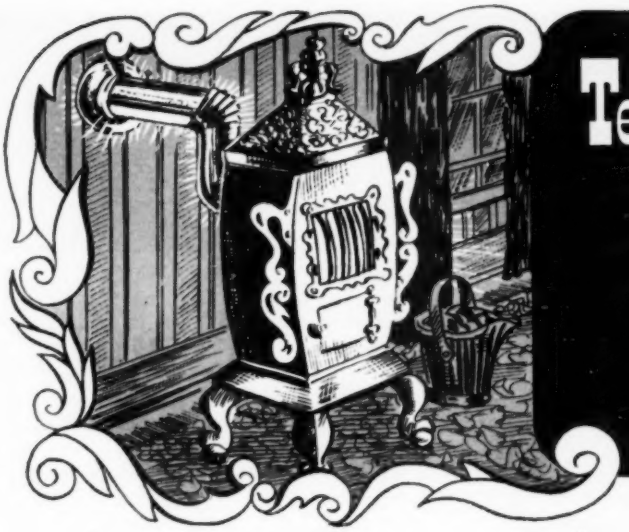
June 18-20 — Carolinas Roofing and Sheet Metal Contractors' Association, Annual Convention. Ocean Forest Hotel, Myrtle Beach, S.C. Beverly M. Rose, Secretary, P.O. Box 708, Durham, N.C.

June 22-24 — National Heating Wholesalers Association, Inc., Spring Convention. Grove Park Inn, Asheville, N. C. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

June 25-27 — Sheet Metal and Roofing Contractors Association of Minnesota, Summer Convention. Breezy Point Lodge, Brainerd, Minn. Arlowe W. Esau, Secretary, Mapleton, Minn.

June 27-July 1 — American Society of Refrigerating Engineers, Spring Meeting. Lake Placid Club, Lake Placid, N. Y. M. C. Turpin, Secretary, 40 W. 40th St., New York 18.

June 29-July 1 — American Society of Heating and Ventilating Engineers, Semi-Annual Meeting, Denver. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.



Terrific in 1903!

This was hot stuff—and we do mean HOT—fifty years ago. The red-hot stove-pipe imparted a cheery glow to grandmother's parlor—and sometimes burned the house down!

It was the last word in 1903...

but today...it's AMERIVENT!

THE DOUBLE-WALL Insulated GAS VENT

PRESENT-DAY GAS HEATING INSTALLATIONS must conform to rigid safety requirements . . . and **AMERIVENT** flue pipe and fittings meet those requirements!

THIS MODERN, SCIENTIFICALLY-DESIGNED VENT offers the high insulation value of double-wall, all-aluminum construction. Combustible walls and framing members are fully protected from damaging flue heat—for the life of the structure!

AMERIVENT SOLVES MANY VENTING PROBLEMS. Its advanced features eliminate hot walls, condensation damage, vent failures, pipe breakage and special wall-construction or "furring out".

INSTALLATION IS MADE EASY with Amerivent's patented **SNAP-LOCK** joint. Simply press the mating ends together, and **SNAP!**—a secure, gas-tight joint results.

COSTS DROP RAPIDLY, TOO, when Amerivent is used. No cement, mastic, screws or tools are needed! Vents install up to three times faster!

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Write for our new 32-page illustrated catalog. Covers AMERIVENT, AMERICAPS and our entire line of standard sheet metal building products.

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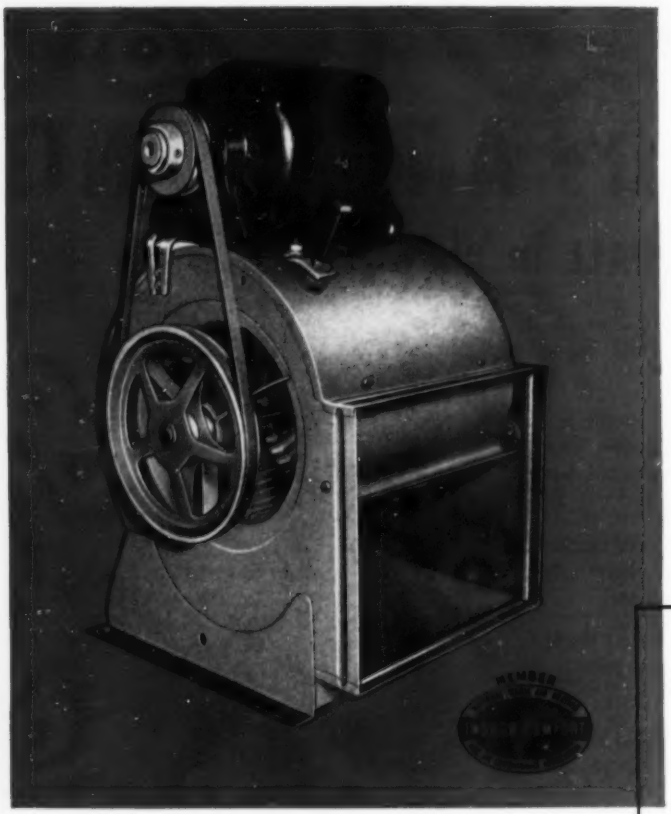
LAU *offers You America's Most Outstanding*

Blower Assembly Unit

the new, improved series "A" unit



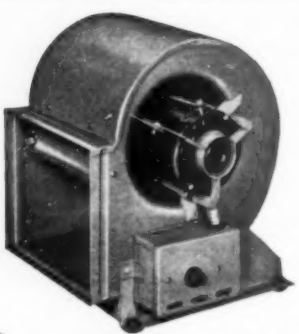
Now further improved . . . the last word in product development . . . LAU Series "A" Blower Assembly. It is an outstanding achievement in the blower field. Over-all size is smaller, more compact. Many features are revolutionary . . . exclusive with LAU . . . and fully protected. The entire unit is die formed to lend itself to mass production on precision-built equipment, with reflected low costs.

These Outstanding Features:

- **Newly developed 1-pc. Motor Mounting**
- **3-point Suspension Bearing Bracket**
- **Bearing Assembly with long-life lubrication**
- **Positive Alignment Wheel to Venturi**
- **Newly Improved LAU steel Pulley Wheel**
- **Strong, Compact, Versatile Housing Base**
- **Unit has efficient Center Suspension Wheel**
- **Improved Discharged Outlet Design**
- **Sturdy, Efficient Scroll Design**
- **Off-set in Scroll sides. Many other features**

The ALL NEW . . . A7DD Direct-Drive DOUBLE INLET BLOWER

Perfect unit for in-a-wall gas and oil furnaces . . . has fingertip adjustment for wide range 7-speed control. For furnaces to be rated at capacities from 44,000 to 76,000 b.t.u. per hour (bonnet) at 100° temperature rise—or capacities from 31,000 to 54,000 b.t.u. per hour (bonnet) at 70° temperature rise.



The A7DD is the ONLY unit completely UL approved, covering the ENTIRE unit (also approvable in combination with furnace).

THE LAU BLOWER COMPANY • DAYTON 7, OHIO

2011 Home Avenue • Write for Full Information

World's Largest Manufacturers of Warm Air Furnace Blowers

SERVEL CREATES DEMAND WITH THE

biggest advertising push in air conditioning history!

NOW! Complete home heating, cooling, air conditioning with one unit at a price almost anyone can afford!
Servel All-Year air conditioner at a new low price... little more than the price of a heating system alone!
"Big-home Size"
$1395.00
DELIVERED
Gives you all seven air conditioning benefits
Servel
the name to watch for great advances in
AIR CONDITIONING ✓ REFRIGERATION

Watch sellective Servel advertising in these publications reaching millions of prospective customers:

Time • Saturday Evening Post • Better Homes & Gardens
The American Home • House Beautiful • House & Garden
Sunset • House Beautiful Maintenance & Building Manual
House & Garden Book of Building • Small Homes Guide

• This is the year *All-Year* Air Conditioning comes into its own!

And Servel is building demand with the greatest advertising and merchandising push in air-conditioning history to tell *millions* about the benefits of year-round climate control and Servel's famous "no moving parts" design.

Riding the crest of the growing demand for residential air conditioning, Servel dealers will *cash in* on the Servel "Big Push." Get in on the ground floor right *now*. Servel has the advertising and merchandising tools for you to tie in with this national advertising program. Contact your Servel distributor or mail coupon.

Servel

the name to watch for great advances in
AIR CONDITIONING ✓ REFRIGERATION

SERVEL, INC., Dept. AA-5, Evansville 20, Indiana
Tell me more about the Servel "Big Push"—and rush information on tie-in advertising-merchandising.

Name_____

Firm_____

Address_____

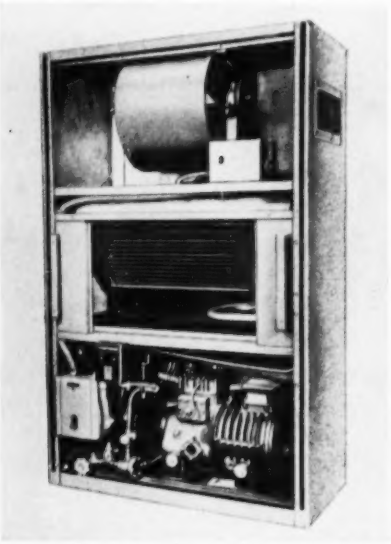
City_____ State_____

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 172.

Cooling Units for Homes and Stores

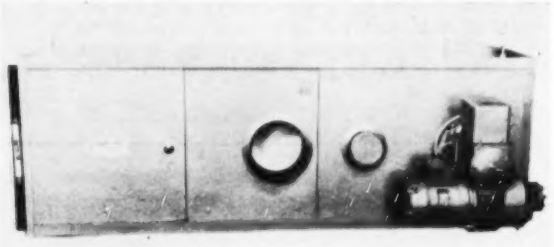
NEW LINE of summer cooling units for homes and stores, featuring a semi-hermetic compressor condensing unit that is bolted to a spring-supported base for quiet operation — Thatcher Furnace Co., Garwood, N. J. Connec-



tions for water lines can be made from either side. A heating and cooling thermostat with relay is supplied on the residential units, which are intended for installation with a heating unit on one common duct system, using a damper arrangement. Store units are furnished with a three position switch for temperature control. AA 1

Suspended or Counterflow Furnace

OIL-FIRED WINTER AIR CONDITIONER, in models of 75,000 and 100,000 Btu per hr, which can be used either as a suspended or counterflow furnace and is designed for



use in restricted space installations (closets, attics, etc.) — Connecticut State Furnace Co., Inc., Bridgeport. As suspended furnaces, units can be installed with the cold air return on either end by reversing the unit and the burner, thus leaving the burner in front at all times. For use as counterflow furnaces for perimeter heating, units stand on end with the warm air outlet on the bottom. Units are shipped complete with centrifugal type blower fan, rubber mounted motor with variable pitch pulley for belt drive or variable speed motor for direct drive, glass wool filter, and stainless steel combustion chamber. AA 2

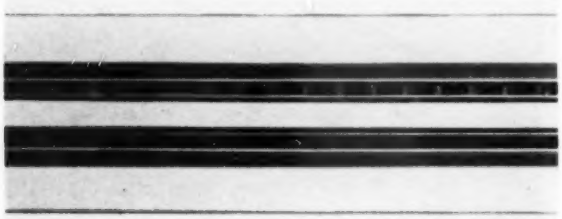
Bending Machine

HYDRAULICALLY OPERATED Di-Acro bending machines, redesigned for more even distribution of stress developed during bending, and to keep mechanical distortion to a minimum — O'Neil-Irwin Mfg. Co., Lake City, Minn. Formerly made in fabricated steel, it is now offered in

a strongly-ribbed alloy casting designed to provide greater strength and to allow integration of the gear housing into the casting for positive alignment. Other improvements include addition of foot controls and replacement of a 2 hp with a 3 hp motor. The machine can be used for forming simple and complex bends in round stock, tubing, extrusions, etc. AA 3

Slot Type Air Diffusers

TWO NEW SLOT TYPE Agitair Stripline continuous air diffusers (one with slightly greater "blow" than the

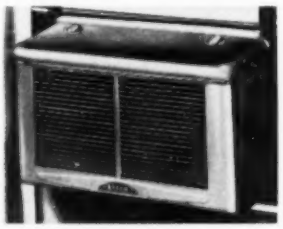


other) — Air Devices, Inc., New York. The units employ the "vaned" principle of air distribution, with

built-in diffusing vanes producing high turbulence, aspiration and temperature equalization. The diffusers are designed to insure a continuous blanket of unvaried air over a pre-determined area without noticeable air motion, eliminating drafts or hot spots. AA 4

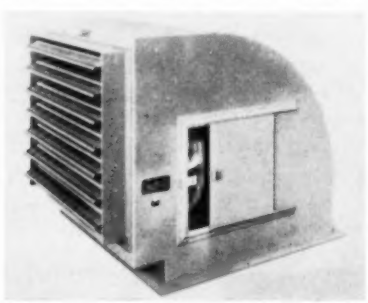
Window Type Air Conditioners

MODEL 2050 WINDOW TYPE room air conditioners that cool, dehumidify, exhaust and ventilate — Rheem Mfg. Co., Chicago 29. Units are available in ½, ¾ and 1 hp sizes. A rotary type compressor with "Freon" refrigerant is employed. The hermetically sealed cooling system is capillary tube controlled. Condenser and evaporator coils with aluminum fin surfaces are of continuous copper tube construction designed to minimize the chance of refrigerant leakage. Cabinets are 16½ in. high, 28½ in. wide, and 10 in. deep. AA 5



Penthouse Fan

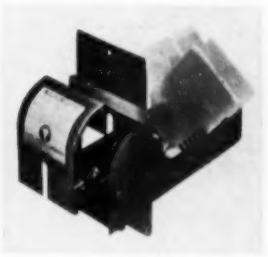
PENTHOUSE FAN, in belt-driven and direct-driven models, streamlined to minimize obstruction to air stream, thereby reducing air impact and rumble — Chelsea Fan & Blower Co., Plainfield, N. J. They are undercoated with noise deadening material. The front section features a bypass tray, discharging back onto the roof any water which may pass the shutters during severe rain storms. Motors are totally enclosed or explosionproof. Insulation on interior walls, designed to prevent condensation or conserve heat, is available on both units. For ventilating buildings with ceiling temperatures of 75 F or more, the company recommends the use of automatic ceiling shutters installed directly below the unit. Sizes are 12 to 60 in., with 5000 to 40,000 cfm capacities. AA 6



Portable Evaporative Cooler

ZIP-AIR PORTABLE EVAPORATIVE COOLER that plugs into any light socket and is designed to deliver 300 cfm through dual centrifugal blower wheels — Trade-Wind Motorfans, Inc., Los Angeles. It contains its own water supply of 3 gal capacity. Weighing 27 lb, it is equipped with a retractable handle. A three way switch permits operation for air circulation only or for complete cooling. There is an independent motor driven water circulating pump. AA 7

Evaporative Cooler



Humidifier

Humidifier

WET-WING HUMIDIFIER assembly with four evaporator plates — Econo-Matic Products Co., Inc., Detroit. The stamped pan (5 x 13 in.) is protected with acid resisting porcelain enamel. The float valve has a brass body, neoprene seat. The hook-on float is long lasting and easy to remove, the manufacturer states. Pan and evaporator plates are designed to permit placing of lime collecting stones. The non-drip evaporator plates are

(Please turn to page 160)

This coupon is for your convenience in obtaining more information about any of the equipment mentioned in this issue. Keep your record of sources of supply up to date by adding the new products and companies listed here to your January 1953 AMERICAN ARTISAN annual directory section.

FOR YOUR CONVENIENCE **5-53**

American Artisan
6 N. Michigan Ave., Chicago 2, Ill.

Please ask the manufacturers to send me full particulars about the equipment mentioned under the following reference numbers in Equipment Developments

(Circle each number in which you are interested)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26

Name ..... **Title** .....
Company .....
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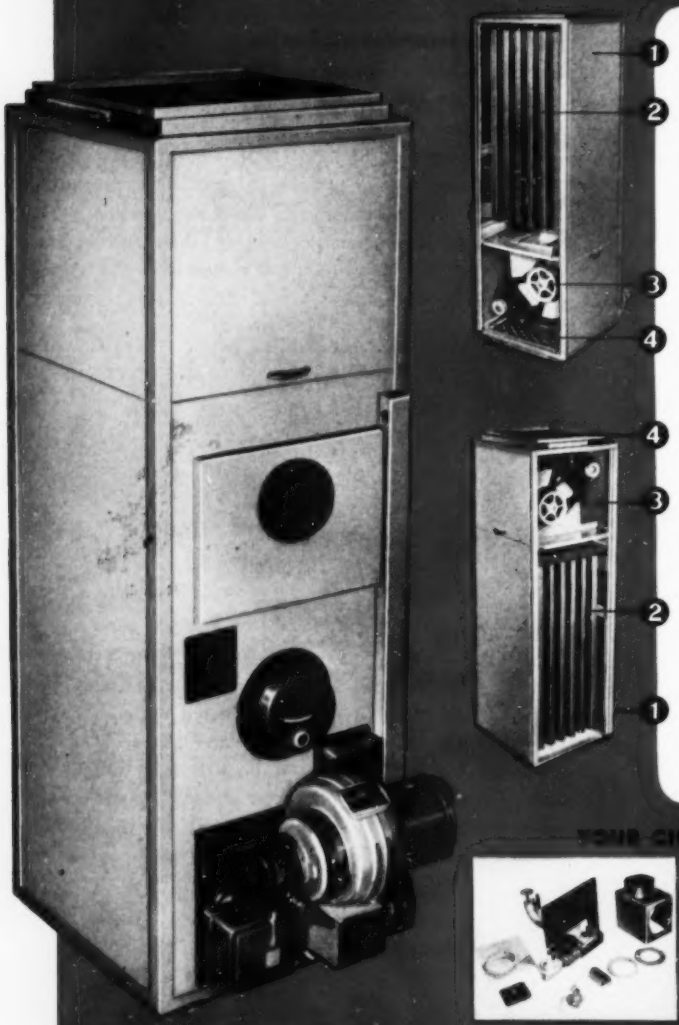
WINKLER *Universal*

OIL AND GAS-FIRED FURNACES



This furnace meets all home heating requirements in the easiest, most convenient way you've ever seen. The same unit can be used for either up-flow or counter-flow operation by merely re-arranging the parts. The Winkler Universal is a complete package . . . everything included, except ducts, for a basement or utility room installation.

1. **Casing and insulation.** Clean, trim design—baked enamel finish. Cellular asbestos, faced with aluminum foil, produces an amazingly cool casing.

2. **Heat exchanger.** Unique corrugations greatly increase the heat transfer area . . . 42% more area with the same floor space. The distribution pattern of hot gases, together with a minimum of internal resistance, make this heat exchanger a non-pulsating unit.

3. **Extra quiet fan.** All moving parts carried in soft rubber—no vibration.

4. **Filter frame.** Snaps into any of the five sides adjacent to fan compartment... assures greater adaptability to various installing situations...keeps duct costs down.

5. **Pre-wired at factory.** All wiring is in place and connected. Just connect burner and line wiring—a real time saver.

Individual Winkler Gas Burner kits are provided for natural, manufactured, mixed and LP gases... and for natural and LP gas combination requiring an outside temperature switch.

For oil-firing, the Universal may be equipped with either the Winkler High Pressure or Low Pressure Burner. Oil Burner kits include everything necessary for a complete installation—combustion chamber, controls, barometric draft, etc.

Both Gas and Oil Burner kits are pre-wired for quick, easy connection to the pre-wired Universal Furnace.

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U. S. MACHINE DIVISION • Dept. A-53 • LEBANON, INDIANA

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FOR YOUR DEFENSE PRODUCTION

ROTARY MACHINES *for* SHEET METAL WORK

BEADING
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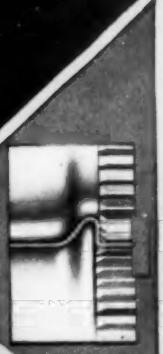
SPECIAL

NEW FURNACE COLLAR EDGING ROLLS



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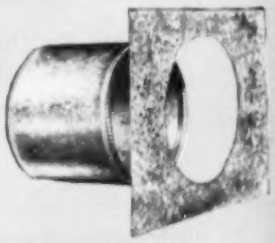
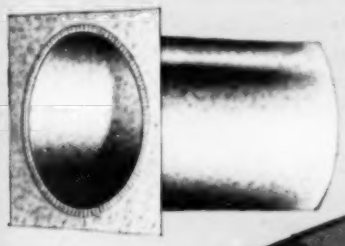


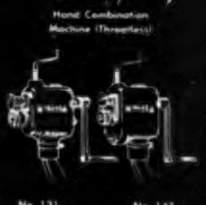
No. 164 Universal Rotary Machine with Furnace Collar Edging Rolls



Pipe inserted and hammered flat

Write for Bulletins 75 and 85

No. 172 No. 180



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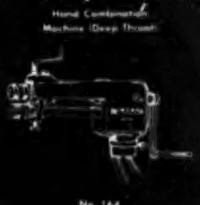

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No. 189 No. 185 No. 188

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

America's Most Complete Line Presses, Shears, Machines and Tools for Sheet Metal Work

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CONDENSERS —

(*Continued from page 71*)

pressure starts to level off instead of increasing. After a short period, the head pressure will level off and no matter what the water inlet temperature, the valve will admit only just enough water to the condenser to maintain the head pressure at the desired point. The warmer the water, the more will have to be used to maintain the head pressure. Once the valve is wide open, it can no longer admit sufficient water to maintain the head pressure. Therefore, the pressure will "slip" up. This happens on occasion when inlet water temperatures become excessively high.

Water valves are usually adjustable so that they can be set to maintain a desired head pressure. The temperature of the leaving water is a good index of head pressure, so that, except for installations where the water supply is unusually cool or warm, valves are set to maintain a leaving water temperature of 95 F. On large installations studies are made to determine the most economical balance point between electric power costs (kept low by keeping head pressures low with large water quantities) and water costs (kept low by running at high head pressures requiring more electric power).

This discussion will be continued in a subsequent article where evaporative condensers and cooling towers will be covered.

new refrigeration group told . . .

Heating Men Doing the Home Cooling Work

RESIDENTIAL AIR CONDITIONING represents a tremendous market potential — particularly new and existing homes heated by forced warm air. Because of this, warm air heating dealers have not only taken the ball but are running with it, as evidenced by steadily increasing sales throughout the country and the increasing numbers of furnace manufacturers offering residential cooling equipment.

These facts, and similar remarks, were expressed last month at the first annual meeting of the recently formed Refrigeration Trade Association of America. Incorporated last May in the District of Columbia, the RTA now includes approximately 150 members, with five local chapters located in Baltimore, Md., Montgomery, Ala., Richmond, Va., Washington, D. C., and Winston-Salem, N. C. The association has been formed to embrace refrigeration and air conditioning servicemen and mechanics, contractors, wholesalers, manufacturers, and other refrigeration associations. Among its objectives is the establishment of trade and craft recognition for its members commensurate with the classifications establishing trades and crafts in other industries. In line with this, RTA recommends the licensing of refrigeration and air conditioning contractors and mechanics "wherever and whenever such action would prove beneficial on the local and national level."

Nationwide Activity in Residential Cooling

In discussing the future of residential air conditioning, T. S. Pendergast, sales manager, Tecumseh Products Co., briefly sketched the large potential market and stated that "almost every major furnace manufacturer" is now in the cooling business or is doing experimental work along that line. This residential air conditioning, he said, is not confined to the southwest part of the country, but is rapidly spreading north and east. Moreover, the great majority of the jobs being sold today are sold by dealers who have been doing warm air heating work and are now including cooling in their work.

In the opinion of Mr. Pendergast, not enough attention is being paid to the use of air-water condensing units (air cooled condensers with supplementary use of water as necessary to control head pressures during extremely hot weather).

In his talk on residential air conditioning and heating, Frank Hudik, president, Comfortair Co., heating, ventilating and air conditioning contracting firm of Hackensack, N. J., stated that new homes no longer represent a sellers market, and that builders have a selling job to do. Air conditioning, he said, is their best selling tool. It was also pointed out that existing homes heated by forced warm air represent a large (possibly the largest) market.

Installation Recommendations Given

Recommendations as to the design and installation of residential cooling systems given by Mr. Hudik included the following:

1) In an existing residence check the capacity of the furnace blower to be sure it is adequate.

2) Check the location and type of air supply outlets and where necessary, use adapters or new grilles so as to deliver the cool air upward to the overhead.

3) Install the evaporator or cooling coil on the discharge side of the fan.

4) Use constant blower operation to provide better circulation and reduce stagnation.

5) Be sure to admit outside air to the system.

6) In the design of cooling systems for residences it is not necessary to do a perfect job. A 12 to 13 deg temperature differential is generally satisfactory.

In his concluding remarks, Mr. Hudik suggested that refrigeration contractors and service organizations develop ways and means of cooperating with the warm air heating dealers who are the ones selling residential summer cooling.

New **MOR-SUN** Heat Exchangers

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—to make your selling easier!

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Mor-Sun Warm Air Furnaces — Gas or Oil Fired — come in 10 models, conventional or reverse flow. Output range 52,000 to 152,000 BTU's.

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• Sell MOR-SUN Furnaces and you can sell with confidence. To make your sales job easier we offer MORE with MOR-SUN . . . a 10 Year written Guarantee on every MOR-SUN Heat Exchanger in addition to our standard one-year warranty on all complete units. Check these 12 points of superiority and you will see why we do not hesitate to guarantee any MOR-SUN Warm Air Furnace.

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Gentlemen:

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1 PROFIT from automatic heating

Wherever you've sold a space heater, it's easy to make a second sale. Sell the famous, nationally advertised A-P Thermomatic Comfort Control — and provide your customer with the healthful comfort of even, automatically controlled heat. Needs no installation or electrical connections . . . fits most space heaters equipped with an A-P manual control valve.

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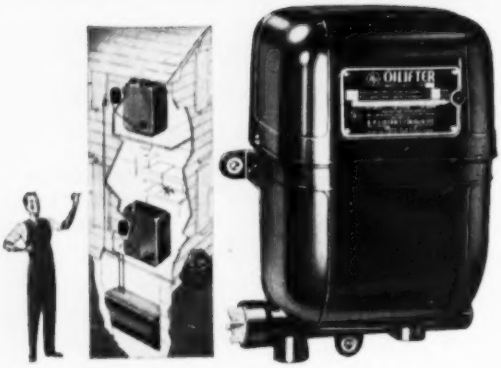

Then, sell your customer on the clean, easy fuel oil handling he'll get with an A-P Oilifter. The Oilifter will draw oil from tank or drum located outside or in the basement — and will deliver it to the third floor if necessary! There's no worry, no mess, no effort.

3 PROFIT from increased efficiency

And — to free your customer from all danger of burner failure due to dirt, moisture or impurities in oil — sell him an A-P Fuel-Oil Trap-It. Eliminates costly service calls . . . prevents flame failure erratic flow, oil leakage and sluggish operation.

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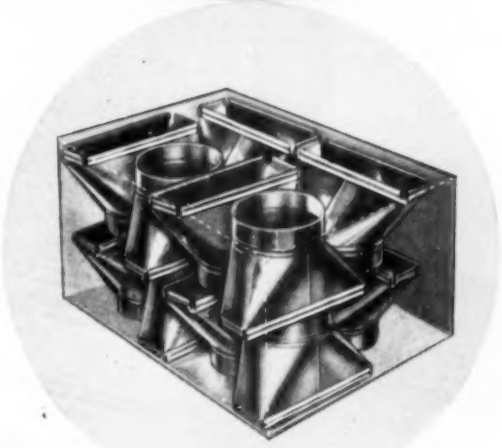

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If you had the combined experience of thousands of dealers, this is the furnace and pipe & fittings line you'd design to build maximum profits and good will for your firm. It assures minimum installation time . . . utmost owner satisfaction with fuel economy and trouble-free service . . . gives you a good profit, selling competitively.
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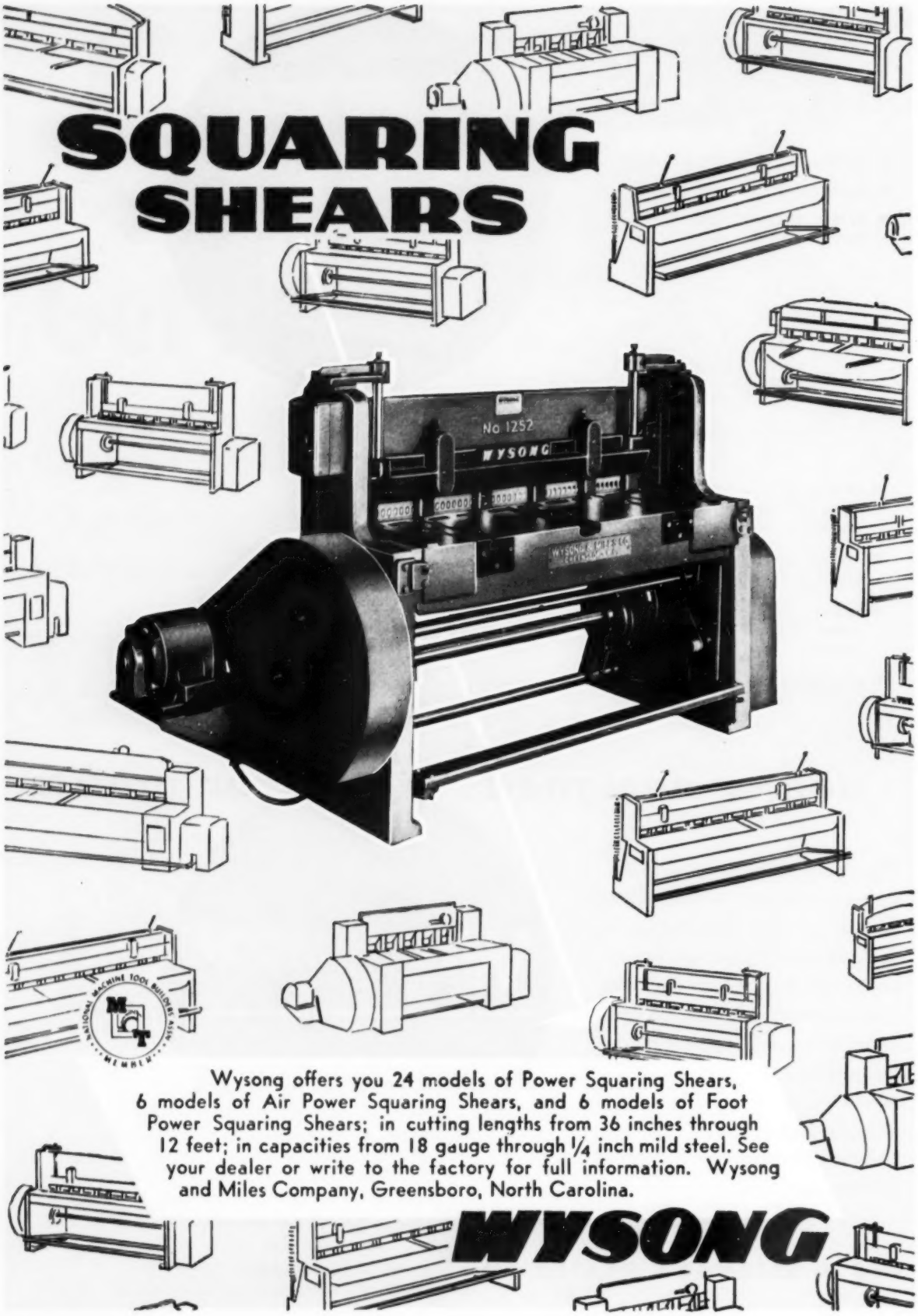


Wysong offers you 24 models of Power Squaring Shears, 6 models of Air Power Squaring Shears, and 6 models of Foot Power Squaring Shears; in cutting lengths from 36 inches through 12 feet; in capacities from 18 gauge through 1/4 inch mild steel. See your dealer or write to the factory for full information. Wysong and Miles Company, Greensboro, North Carolina.

WYSONG

MUST KNOW OVERHEAD —

(Continued from page 102)

The question of what to do with these funds will be covered later. First, there is another item of great importance which is directly concerned with the disposal of funds which do not properly belong in the business account — and that is turnover.

Try for High Turnover on Capital

Turnover might well be described as the relation of the gross volume of business during a given period to the capital investment. If the contractor has an invested capital of $10,000 and does $50,000 worth of business a year, he has five turns, or his turnover ratio is five.

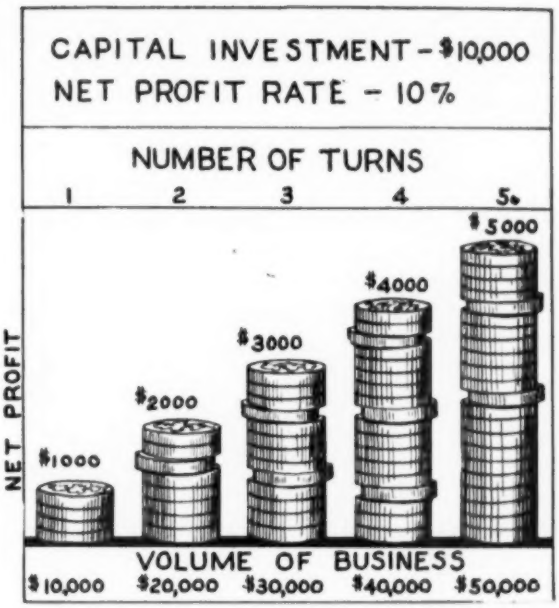
Remember when you started in business with not enough capital — how you got by? Your job was hardly completed, or perhaps it was only partially completed, when you were after the customer for some or all of the price of the job. You got those dollars rolling so fast that they never had a chance to rest for even a moment. You were working at top efficiency, at least in regard to making your money stretch to the limit.

It is the general practice of vast numbers of contractors to carry all of their funds in the business account. If they have some degree of success, the bank account grows and sometimes reaches substantial proportions. This can lull one into a false sense of security and lead to unwise spending. Certainly, the accumulation of a considerable amount of money in the business account tends to make one less aggressive and less efficient as the account grows.

If you would keep at top efficiency, keep your business account somewhat starved for capital. Make your capital work for you as fast and effectively as it is possible to do. Every dollar you have lying around in the business account becomes capital investment as long as it remains there. Thus, if you started and operated for a while with a $10,000 capital and have let funds accumulate until you have another $10,000 in the business account, your capital investment is twice what it was when you started. If your volume has correspondingly increased, that is not too bad. The graph above shows the effect of turnover on profits.

If it were possible to do $100,000 worth of business with this investment, the net profit would equal the entire investment each year. The lower the capital investment can be kept within reason, the greater the turn ratio, and the greater the profit rate. As the capital investment creeps up, generally the turn ratio reduces.

The president of a national wholesale chain once informed the writer that the average of their outstanding accounts was 59 days, and they were losing money. By dint of much effort, they were able to cut the outstanding average down to 36 days, and were able to make money without increasing their selling prices. This seems substantial proof that increasing the turnover of a business is profitable. The reduction of the time of the outstanding accounts of this firm virtually gave them the equivalent of a 10 per cent increase in their working capital without the addition of an extra dollar.



HOW TURNOVER affects profits

Increasing your turnover can be accomplished by carefully scheduling your work, getting the job done as quickly as possibly after starting, and, above all, getting your money in just as soon as possible after the work is completed. This, and keeping your capital investment at the lowest possible level, is the method by which the greatest turnover ratio can be secured and maintained.

Owner's Capital Account Useful

A special account seems to be the answer to what should be done with the several items of overhead, controversial and otherwise, which have been mentioned.

The interest due on invested capital should be taken from the business account at regular periods and paid into this owner's capital account.

Rent for your own building which is used in the business should be paid monthly into this account, unless you want to include the value of the building as part of the capital investment — which boosts your capital to a rather high amount and materially reduces the turn ratio which can be maintained. Operation and maintenance of the building is also a part of the overhead of the company. Incidentally, carrying the property as a separate business will enable the contractor to better know whether owning the business property is cheaper or more costly than renting.

Some owner's pay may be deposited in this special account. The owner of a business should be the most valuable employee of that business, and is entitled to top pay for services performed. If he works on his jobs, a part of his time will be direct job cost, but the balance of the time spent is

Table 1—Owner's Capital Account (Invested Capital—$10,000)

	Year	*Month*	*Week*
Interest 6%	600.00	50.00	12.00
Rent	480.00	40.00	10.00
Depreciation, $5000 equipment	840.00	70.00	16.00
Earned over Drawing Account	780.00	65.00	15.00
Totals	2,700.00	225.00	53.00

overhead, and should be so allocated. The owner should pay himself what he has earned as an employee. If he takes less, then the rest of the money due him for services should be taken from the business and deposited regularly in the other account.

Depreciation reserves should be removed from the business account and put in the owner's capital account at regular intervals. It is perhaps easier to reduce your depreciation payments to a weekly basis, which is a small amount and more easily spared than would be monthly or quarterly payments.

Net earnings should be transferred to the special account as soon as the accounts for the preceding period have been cast up.

If this plan is followed, even in a small business, the owner's account will soon build up into a considerable amount. If extra funds are needed for the business at any time because of an extra heavy volume of work, they may be borrowed from the other account, but the interest should be paid regularly and the funds returned as soon as possible. The fund should be treated as if it belonged to someone else, or as a bank loan. If more capital is needed from time to time because of increasing volume, more money can be invested in the business from this account.

Creating an Estate

As funds accumulate in the owner's capital account they should be periodically invested in good income producing securities which should bring dividends, and a probable increase in the value of the securities over a period of time.

After this program is started, all income and all cash accrued should be invested at least semi-annually. If this can be done so as to produce an average return of 6 per cent it will be the same as compounding interest semi-annually.

Table 1 (above) is compiled upon this basis — 6 per cent annual average return and semi-annual purchases with the accrued funds plus any dividends. This is without consideration of any possible increase in the value of the securities held.

In 20 years, there would be $54,000 in the account. Invested income producing securities netting 6 per cent average would, compounded semi-annually, amount to:

	Years	*Dollars*
	5	15,476.23
	10	36,263.91
	15	63,427.60
	20	100,717.68
Fund Appreciation	20	46,717.68

As equipment wears out or becomes obsolete, thereby necessitating the purchase of replacement equipment, some of the securities from the owner's capital account may be used as collateral for bank loans, which can undoubtedly be paid back from the monthly accumulations for the fund. The dividends received on the securities so pledged will offset the interest on such a loan. It will be much cheaper than regular time-financing, in any event.

Using the special account, a contractor can build himself an estate in a comparatively few years. Naturally this must be predicated upon sound operation and an ability to procure work at prices which will permit the setting aside of these funds as recommended. In addition to the sales requirement, there must be the ability to estimate properly, to expedite the work, and to cut down the outstanding accounts to the absolute minimum by speeding collections to the utmost. These recommendations will speed up turnover and keep the firm at top efficiency long after management would normally slow down.

The entire premise of these articles has been that there is a right and proper way of keeping accounts and of running a business, that the definition of accounting precludes sloppy bookkeeping which does not distinguish between the income from capital, ownership and personal services of an owner and the profits directly from the business of contracting. By following the principles given, the contractor will know from day to day whether his business is actually making profits or not. There will be no long, tragic wait until he is finally closed up by his creditors. He will also be in a position to know just what phases of his business are profitable. He will be in a position to control his affairs because of the intimate knowledge of his business which will be available at any time.

Test Type 430 Panels

A TEST FENCE at the Massillon, Ohio, mill of Republic Steel Corp., contains several panels of Type 430 stainless steel which have been set out from time to time over a period of years to test their reaction to the acidic, sulphurous, and sooty waste discharges from yard locomotives, pickling facilities, and furnaces. Recently six panels were examined. Two of these are corrugated sheet exposed since 1926.

These varied in gage, being 0.013 in., 0.017 in., and 0.029 in. All originally had a rough pickled finish. None has ever been cleaned. It was found that all were covered with a heavy dark brown film. This adhered tightly to the surface, but could be removed by rubbing with an abrasive grit eraser. The surfaces of all three were in fairly good condition, and there was no evidence of any tendency to perforate or fail.

The metallurgists making these examinations conclude that Type 430 is satisfactory as a corrosion resistant material for outdoor applications, even if atmospheric conditions are relatively severe. They point out that periodic use of a fine grit cleanser should keep surfaces free of whatever tarnish and discoloration occur.

REVERSIBLE OFFSET FITTING —

(*Continued from page 106*)

gravity furnace has required of the sheet metal man a greater versatility in the use of other than standard fittings to meet the varying conditions encountered in furnace installations. In the illustration, Fig. 1, is shown a center reversible offset on the side of a narrow plenum. The elongated opening will permit an even flow of air from the plenum into the duct.

In Fig. 2, an illustration of a two way reversible offset is shown in a return air duct on the basement wall at approximately ceiling height. In an installation of this type it is good practice to have the long side against the wall.

Following is a step by step solution to the pattern development problems.

To Layout the Pattern Marked Fig. 6:

(a) Draw the vertical line marked CL (center line), measure 1¼ inch and marked the points CD.

(b) Through points C and D draw lines perpendicular to the center line, CL. From point D measure ⅞ inch on both sides of the center line and mark the points E and F. From point C measure ¼ inch on both sides of the center line and mark the points G and H. Draw the lines EG and FH.

(c) From point F, draw a line at 90 degrees to line FH. From point F measure ½ inch and mark the point J.

(d) From point H draw a line at 90 degrees to line F-H. From point H measure 1¾ inch and mark the point K. Draw the line J-K.

(e) From points E and G draw lines at 90 degrees to line E-G. From point E measure ½ inch and mark the point L and from point G measure 1¾ inch and mark the point M. Draw the line LM.

(f) From point L draw a line perpendicular to line E-L and mark the distance from point M to this line, B. *Note*: Distance B is equal to 1¾ inch minus ½ inch, which is 1¼ inches. From point F draw a line connecting points F and G and mark this line, A.

(g) To develop the true length line, draw a right angle. Transfer the diagonal line marked A from Fig. 6 to the vertical leg and distance B from Fig. 6 to the horizontal leg. The hypotenuse line AB is the developed diagonal line for the offset side.

(h) With point J on Fig. 6 as center and radius AB, draw an arc. With K as center and radius ½ inch cut arc AB, mark the point P. Draw line KP.

(j) With point K as center and radius AB draw an arc. With J as center and radius 1¾ inch cut the arc AB and mark the point N. Draw the line NP.

Add allowances for necessary seams and joints and mark the pattern for forming.

To Layout the Pattern Marked Fig. 11:

(a) Draw the vertical line R-S which is 1¼ inch.

(b) From point R, draw a line perpendicular to line R-S, measure ¾ inch and mark the point T. From point S, draw a line perpendicular to line R-S, measure 1½ inch and mark the point U. Draw the line T-U.

(c) From point R, draw a line perpendicular to line R-S, measure 1½ inch and mark the point V. From point S, draw a line perpendicular to line R-S, measure ¾ inch and mark the point W. Draw the line VW.

(d) From point V draw a line perpendicular to line V-W, measure ¾ inch and mark the point X. From point W, draw a line perpendicular to line VW, measure 1½ inch and mark the point Y. Draw the line X-Y.

(e) From point T draw a line perpendicular to line RT and mark the distance from point U to this line, C. *Note*: Distance C is equal to 1½ inch minus ¾ inch which is ¾ inch. From points R and V draw diagonal lines to S and W. Mark the diagonal lines A and B.

(f) To develop a true length line, draw a right angle. Transfer line B to the vertical leg and length C to the horizontal leg. The length B-C is the developed length of the line. With BC as radius and point X on Fig. 11 as center, draw an arc. With point Y on Fig. 11 as center and radius ¾ inch cut arc BC and mark the point Q.

(g) To develop a true length line, draw a right angle, transfer line A to the vertical line and line C to the horizontal line. The hypotenuse line AC is the developed length of the line. With point Y on Fig. 11 as center and radius AC draw an arc. With point X on Fig. 11 as center and 1½ inch radius, cut the arc AC and mark the point Z. Draw the line ZQ.

Add the necessary allowances for seams and joints and mark the patterns for forming.

Sees Air Conditioners For Average Family

UNIT AIR CONDITIONERS are now within reach of many home owners, but within the next few years many more families will be able to afford them, according to John J. Bachner, chairman of a committee on large plastics moldings.

Mr. Bachner commented on recently published reports by an association of refrigerating and air conditioning manufacturers that only 2 per cent of the market for unit air conditioners has been saturated.

Mr. Bachner expects large plastics moldings to play an important part in the growth of this market. High-quality, well-engineered plastics housings and components are not cheap, he pointed out. These materials may cost more than the woods or metals they replace. The cost reductions are possible only because complete housings and components provide production flexibility. They can be high-compression molded in one operation.

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Conversion Burner

needs only one man to demonstrate and install!

A conversion burner that weighs only 40 pounds can knock big figures off your installation and sales costs. That's why the new Bryant "208" Burner is a big profit opportunity for you.

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And you need only *one* man to install the "208". In this unusually light design we have provided a telescoping venturi to give a wide range of dimensional adjustment . . . convenient leveling legs at both front and rear . . . and a rigid, heavy-gauge frame assembly.

And only ONE basic unit meets all your requirements!

Just *one* basic "208" unit covers the entire range from 75,000 to 275,000 Btu/hr for natural gas. You can install it on any job, in furnaces or boilers, large or small. Result—a substantial reduction in inventory requirements—another saving!

The "208" uses all gases. It is priced surprisingly low. Get complete information from your Bryant Distributor or write: Bryant Heater Division, 17825 St. Clair Ave., Cleveland, O.

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It means that it is a *dependable* ignition transformer. It is guaranteed to give positive ignition every time. Its use is assurance of long life and greater freedom from ignition trouble in any oil-burning system.

The WEBSTER ELECTRIC Ignition Transformer shown at the right is the newest addition to a great, complete line. It offers:—

8 *Big Advantages*

1. A large full opening at the top
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Ask for this new Ignition Transformer when placing your order with your Oil Heating Manufacturer, Heating Wholesaler or WEBSTER ELECTRIC Authorized Service Station.

Special problems? If you have any problems involving ignition transformers, bring them to WEBSTER ELECTRIC. *Our Industrial Division engineers and technicians are glad to cooperate to meet special requirements.*

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LENNOX Air Conditioners

LENNOX "STOWAWAY"
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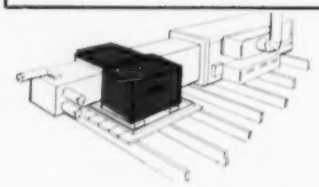
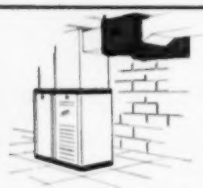


Showing installation in an attic with a "Stowaway" furnace. These units can also be adapted to "crawl-space" homes.

LENNOX "STOWAWAY"
Air Conditioner



A basement installation with LO-BOY furnace.

Ready for Installation in Homes with Forced Warm Air Heating Systems

If your customer already has warm air heating, the Lennox "Stowaway" or "Flat-Top" can be installed at a very moderate outlay, using the present duct system. These Lennox Air Conditioners are completely adaptable to heating systems located in the basement, crawl space, attic, closet, or garage.

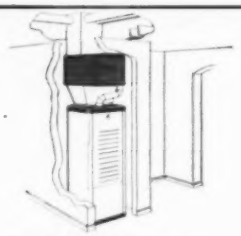
When you install LENNOX you are giving your customer cooling equipment that reflects the experience of 58 years as *specialists* in home heating comfort. Lennox Air Conditioning is efficient, economical and designed for the home to give long years of satisfactory service. That is traditional with all LENNOX comfort conditioners for the home.

LENNOX "Stowaway" and "Flat-Top" air conditioners are hermetically sealed, and available in 2 and 3 ton sizes. Cooling unit carries a 5-year warranty.

For specifications, or installation application engineered to your blueprints, write Dept. CAA-553, The Lennox Furnace Company, Marshalltown, Iowa.

In warm air heating—
more families buy
LENNOX *Aire-Flo Heating*

LENNOX "FLAT-TOP"
Air Conditioner



A closet installation with HI-BOY furnace.

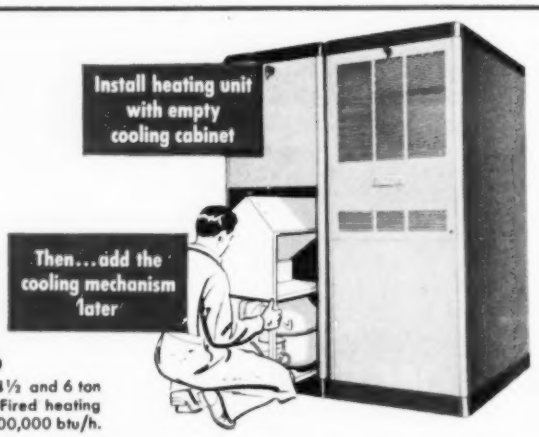
LENNOX "FLAT-TOP"
Air Conditioner

Installation beneath a HI-BOY reverse flow furnace, in utility room.

Install Heating With Provision for Cooling!

You can install the compact LENNOX ALL SEASON Aire-Flo Cabinets that accommodate both heating and cooling—*minus the refrigeration units.* The outlay is only slightly more than that required for LENNOX Aire-Flo Heating only. The addition of cooling at a later date—whenever wanted—is a simple matter requiring little time or service. You simply slide in the refrigeration units from the front and make minor adjustments. This installation may be planned for closets, basements, or garages.

Aggressive heating dealers will welcome this opportunity to enter the air conditioning field. For specifications, or installation application, engineered to your blueprints, write Dept. CAA-553. The Lennox Furnace Company, Marshalltown, Iowa.



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Electric twin refrigeration units, hermetically-sealed, 3, 4½ and 6 ton sizes. Five year warranty on refrigeration units. Gas-Fired heating units, AGA approved, in sizes ranging from 80,000 to 200,000 btu/h.

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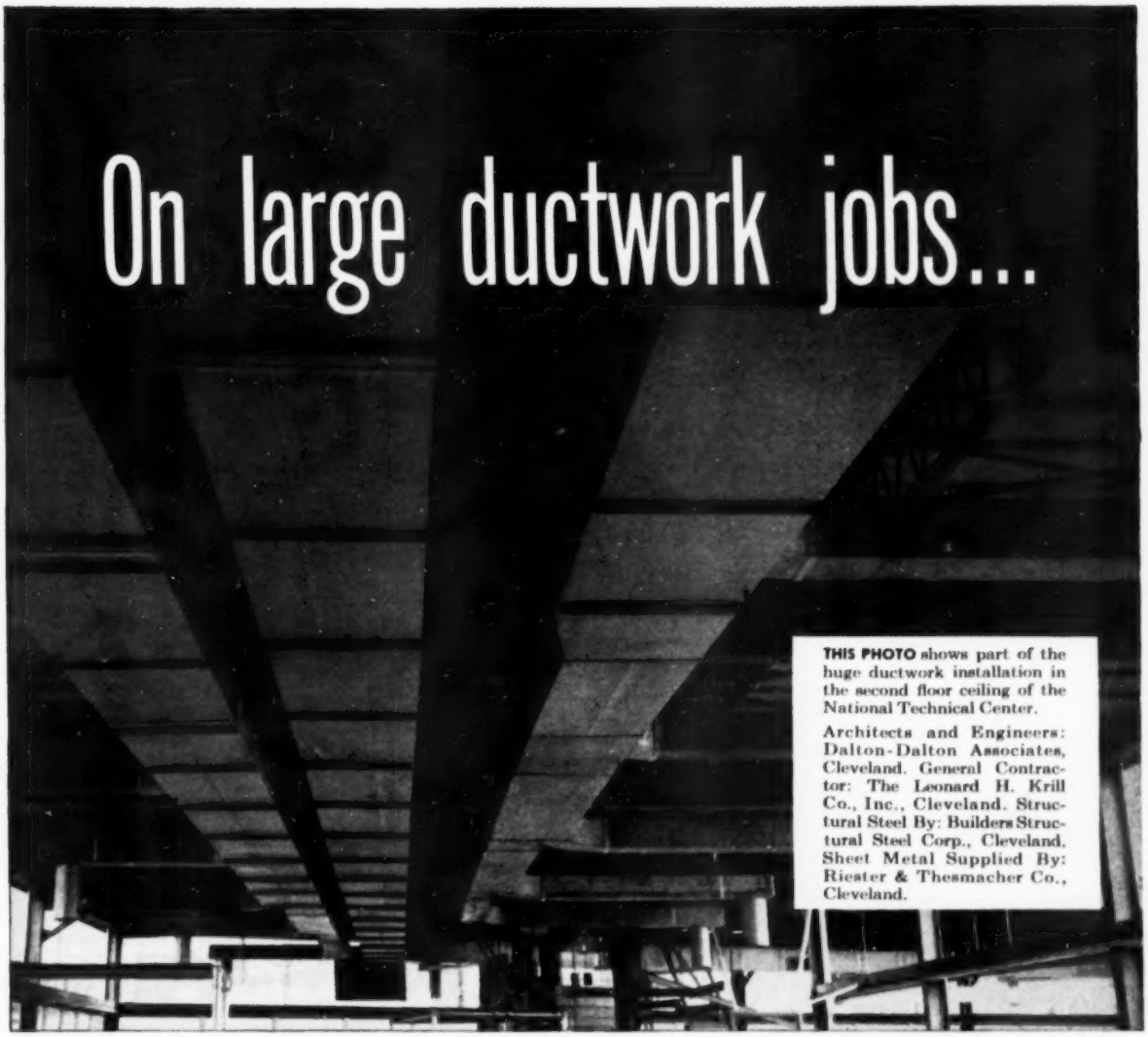

THIS PHOTO shows part of the huge ductwork installation in the second floor ceiling of the National Technical Center.

Architects and Engineers: Dalton-Dalton Associates, Cleveland. General Contractor: The Leonard H. Krill Co., Inc., Cleveland. Structural Steel By: Builders Structural Steel Corp., Cleveland. Sheet Metal Supplied By: Riester & Thesmacher Co., Cleveland.

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THIS large ductwork installation for the heating system of the new National Malleable and Steel Castings Company's Technical Center in Cleveland, Ohio, is typical of the many large jobs that are entrusted to U·S·S Galvanized Steel Sheets. For heating and metal-working men know that for good, time-saving workmanship—neat, long-wearing finished jobs—and satisfied customers, there's no better sheet to use than U·S·S Galvanized.

U·S·S Galvanized Steel Sheets fabricate easily, even under difficult working conditions. They are uniform in softness, flatness and surface . . . can be rolled, bent, cut, stamped or soldered. The heavy, corrosion-resisting zinc coating won't crack or flake during handling.

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U·S·S GALVANIZED STEEL SHEETS

USS

UNITED STATES STEEL

INSTALLED EQUIPMENT —

(*Continued from page* 114)

cardinal inquiry in determining whether the chattel annexed to the freehold is a trade fixture or a part of the realty. Being trade fixtures it follows the landlord should have permitted the tenant to remove them when his lease expired."

No Precise Rules Can Be Given

A few years ago in a decision by the supreme court of a southern state, it was said of the character of personal property and of the circumstances governing its change into realty through annexation to a building or to the land:

"No precise rule can be given which will determine in all cases whether any given property is a chattel or a fixture. This varies with the different relations of the parties as shown or inferred. The precise point at which a chattel loses its character as such and becomes a part of the realty is difficult to define by any fixed rule applicable to all cases."

The measure by which the courts of the country have determined whether heating equipment remains such after it has been installed in a dwelling or whether by such installation it becomes a part of the dwelling, is no twelve inch rule, but a shifty, shadowy line.

A well known authority states, in relation to fixtures:

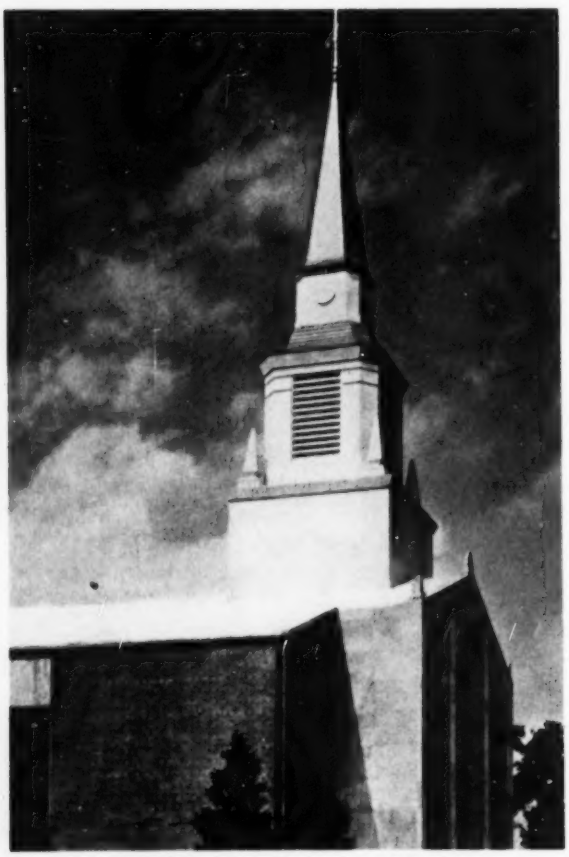
"Fixtures are a species of property which lies along the dividing line between real and personal property, and to decide on which side of the line certain items of property belong is often difficult."

To this is added, "The tests to be applied in determining the question whether the article used in connection with realty is to be considered a fixture or not are even less definite than an attempted statement of the definition of what constitutes a fixture."

The very uncertainty so clearly stated in this comment can be met and overcome by a contractor only by his strict adherence to the statutory provisions for his protection in the filing or recording of any chattel mortgage or conditional sale.

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

Use Porcelain-Enameled Steel for Church Steeple



THE NEW steeple is 14 stories high

THERE'S A NEW steeple 14 stories high on the Central Park Baptist Church in Birmingham, Ala. — and it's constructed of porcelain-enameled steel. The steeple, built by Bettinger Corp., is believed to be the first to be covered entirely with this material.

The porcelain used for the facing weighs 3 lb per sq ft, making possible a light, economical base structure, and the material is usually durable, according to the builder.

Make Full-Size Patterns and Mockups

To construct the 117 ft high steeple, more than 11 tons of porcelain were used. Full size patterns were made of all straight sections, and full size mockups were made of curved sections. The panels are all interlocking to prevent leakage. The curved sections and spire were finished with a shingle effect. They created a problem, since the angles at corners changed with each course. This was solved by fitting the metal to the mockups. None of the porcelain pieces had to be cut or filed on the job.

The facings were braced to the main steel structure with bracing channels and covered with enamel to prevent rust. The porcelain facing is on 16 gage enameling iron, and the bracing channels are constructed of 14 gage enameling iron.

Another special feature of this steeple is the air conditioning equipment installed in its base. There is free access to fresh air through the louvered section of the tower.

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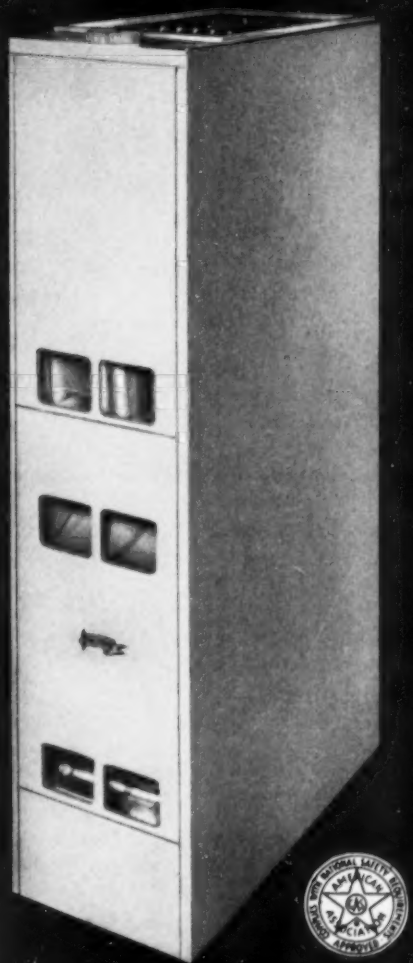

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OIL-O-MATIC Home Heating—with exclusive *Metered Low Pressure.* Complete line for homes of all sizes—for all types of heating.

GAS-O-MATIC Home Heating—with exclusive *Metered Flow Pressure.* Models for homes of every size, large and small.

AIR-O-MATIC Home Cooling—latest member of the famed Williams family. Installed with Oil-O-Matic, Gas-O-Matic or existing forced warm-air heating system to provide year 'round air conditioning at very low cost.

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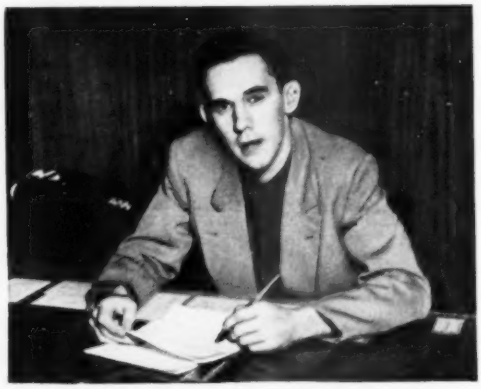
"We now buy only SKIL tools for both shop and field use"

says **Bob Lautenboch,** Secretary,
Corn States Metal Fabricators, Inc.,
Des Moines, Iowa



"Our reasons for standardizing on SKIL tools," Mr. Lautenboch continues, "are their popularity with the men who use them plus the excellent factory branch service we get."

Below—W. L. Blythe, foreman for this general sheet metal contractor, uses a Model 11 SKIL Disc Sander to sand a flange on a chute for a cement company. "Our men like these tools," he says, "because of their excellent design, balance and performance. On some of these jobs it's rough going, but with SKIL tools' compact, portable power going right out in the field with us, our jobs go in fast."

SKIL Disc Sander
Model 11

Heavy-duty sander—a very powerful tool for rough sanding, cleaning or grinding jobs. Uses cup grinding wheels or wire cup brushes up to 5" diameter, or discs up to 7". No-load speed 4200 r.p.m. Over-all length 16¾" not including pad. Net weight 11¾ pounds.

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INDUSTRIAL VENTILATION —

(Continued from page 96)

spoke on the effect of duct fittings on operation.

Models of a properly designed duct system and a poorly designed duct system (main duct and branches built to scale) were used in this demonstration to illustrate the effect of poor design. Pitot tube readings were taken at a number of points and in this particular test it was found that when exhausting approximately 100 cfm, the poor design required 0.136 brake hp as compared with 0.05 hp for the well designed system. Properly designed ducts, therefore, can result in real operating economies.

Unwanted Heat Is an Air Contaminant

Willis G. Hazard, Owens-Illinois Glass Co., presented an interesting lecture and demonstration Tuesday afternoon on the subject of radiation heat and comfort.

Mr. Hazard impressed upon the group that heat is often an air contaminant and should be treated as such. However, the summer heat load on a worker near a furnace in certain "hot" industries can be three-fourths radiant heat and one-fourth hot air, he said. Therefore, when using general ventilation only, we are attacking only one-fourth of the problem.

The speaker had a silhouette of a man's head that was aluminum foil on one side and painted black on the other. A thermopile in the head was connected to a thermometer. He first blew at the black side of the head with a miniature (1300 watt) unit heater which increased the head temperature. A miniature fan directed across the heated-air stream deflected it from the head and so cooled the latter down. He then directed a 250 watt infra-red light at the black side which again increased the temperature, but it was not altered when the fan was turned on. It must be remembered, however, that a blast of air can of course produce a cooling effect by evaporating perspiration. Mr. Hazard's point was well taken and illustrated the difference between radiant heat and heat carried by convection.

The temperature increased very little when the heat sources were directed at the aluminum surface, as it reflects about 90 percent of the radiant heat.

Much progress has been made the past few years in the use of reflective shields to protect the worker from radiant heat. The effectiveness of various materials for this purpose was demonstrated. Aluminum sheet, cloth covered aluminum, and tinted plate glass were the most effective of the materials tested. Reflective clothing (cloth covered with vaporized aluminum coating) has proved very successful in many applications.

Fan Problems and Make-Up Air

The Wednesday sessions were presided over by Albert E. Heustis, M. D., Commissioner of the Michigan Department of Health.

Vic John, Manager, Industrial Div., Detroit office, American Blower Corp., presented a commentary on fan problems. The different types of fans and blowers were described with their particular applications. The most frequent causes of a fan delivering less air than expected were mentioned in order of importance:

1) Poor duct layout.

2) Faulty connections to the fan.

3) Failure to consider other fans in the space.

4) Inaccurate calculation of static pressure requirements of the fan.

Advantages of Tempered Make-Up Air

Wednesday afternoon, Robert Waalkes and Charles Pesterfield — both with Michigan State's School of Engineering — discussed make-up air and selection of equipment.

If the air exhausted from a space exceeds three air changes per hour, it is necessary to provide a tempered mechanical supply system, they said. The following difficulties arise if no outside air is mechanically admitted to the space:

1) The building is subjected to a negative pressure with the system operating under a higher static pressure and less cfm than expected. Contaminant control is then lost because of insufficient velocities through the hoods.

2) Reversal of flow into the building through flues may occur.

3) Control may be lost due to high velocity air leaking in building in areas near hoods.

4) Uncomfortable working conditions may occur near windows and doors.

5) Contamination of otherwise clean areas carried by draft if hoods get out of control.

Advantages of make-up air are:

1) Reduce complaints.

2) Reduce infiltration.

3) Increase in heat load is not as great as sometimes thought, because without mechanical supply infiltration air has to be heated.

4) Can arrange design so supply air is used for general ventilation of whole space.

5) It was possible to reduce exhaust fan requirements as much as 35 percent, in one case mentioned, due to addition of mechanical supply.

When designing a mechanical supply air system it is necessary to:

1) Locate exhaust hoods and calculate cfm requirements of each. Location should be such that supply air will not disturb air near hoods, which would result in loss of hood control.

2) Figure air necessary for combustion.

3) Make sure there is no contamination at source of supply.

4) Care should be taken not to recirculate contaminated air.

A typical air supply system with the methods used to calculate and size the various pieces of mechanical equipment, was described.

A banquet was held Wednesday in the Kellogg Center ballroom. The principal speaker, James W. May, Technical Director, American Air Filter Co., presented a timely address on collecting atomic waste.

He said that industrial ventilation is playing an extremely important part in the AEC program, with exhaust systems of all types employed. The radioactivity of materials necessitates the use of extremely high efficiency collecting systems. Absolute efficiencies of 99.95 percent are required and are being attained.

Mr. Robinson was the chairman for the Thursday sessions.

How To Maintain Maximum Efficiency

J. A. Gavin, Plant Engineer, Ternstedt Div. of General Motors, gave the final talk of the conference — on how to maintain maximum efficiency.

He said that the successful ventilation of a modern industrial plant is dependent on the following factors:

1) Attitude of the plant organization toward ventilation: Management must take an active interest in working conditions throughout the plant and continuously study conditions to determine what can be done to improve them.

2) Maintenance of equipment: Preventive maintenance schedules are necessary, with tests of systems operated.

3) Periodic check of air samples by health officials, who report their findings to management.

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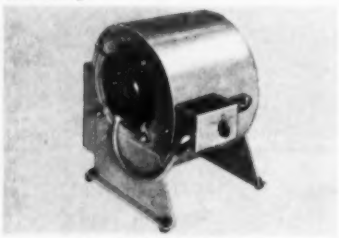

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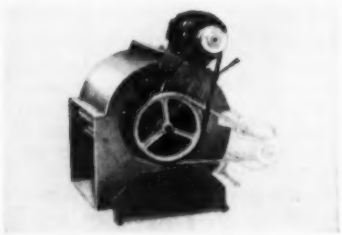

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There's some mighty good potential blower exhauster business for you in the factories, hotels, schools, hospitals and similar buildings in your area. Are you getting your share? You *can* . . . with the Brundage Blower Exhauster.

You can easily solve ventilating, smoke, heat and fume removal problems with this quality blower exhauster . . . to your customers' complete satisfaction, with profit to you. And, the non-seasonal character of this type of business helps level out peaks and valleys in your over-all sales picture.

The Brundage Blower Exhauster, precision-built throughout from quality materials, is quiet-running, requires less service and is tops in efficiency and dependability. These are Brundage qualities that keep customers sold, build profitable "repeat" business for you.

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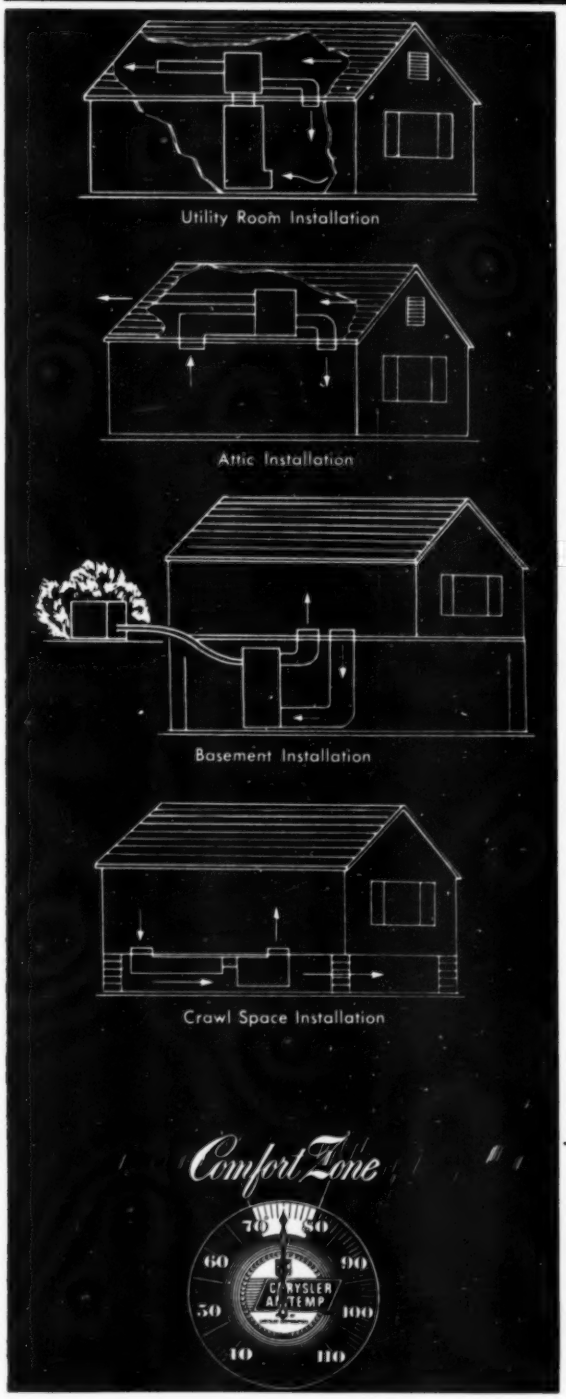

Now nearly every home can be a prospect for Year 'Round Air Conditioning. You don't need water to cool the new Chrysler Airtemp compressor. Put it in the attic, the basement, or outside the house. You'll find these new air cooled compressors cheaper to install . . . cheaper to operate in many areas, too.

But whether you sell air cooled or water cooled compressors, your best bet is Chrysler Airtemp because:

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Get the complete facts on this valuable Chrysler Airtemp franchise today. See how heating and air conditioning can double YOUR profit opportunity!

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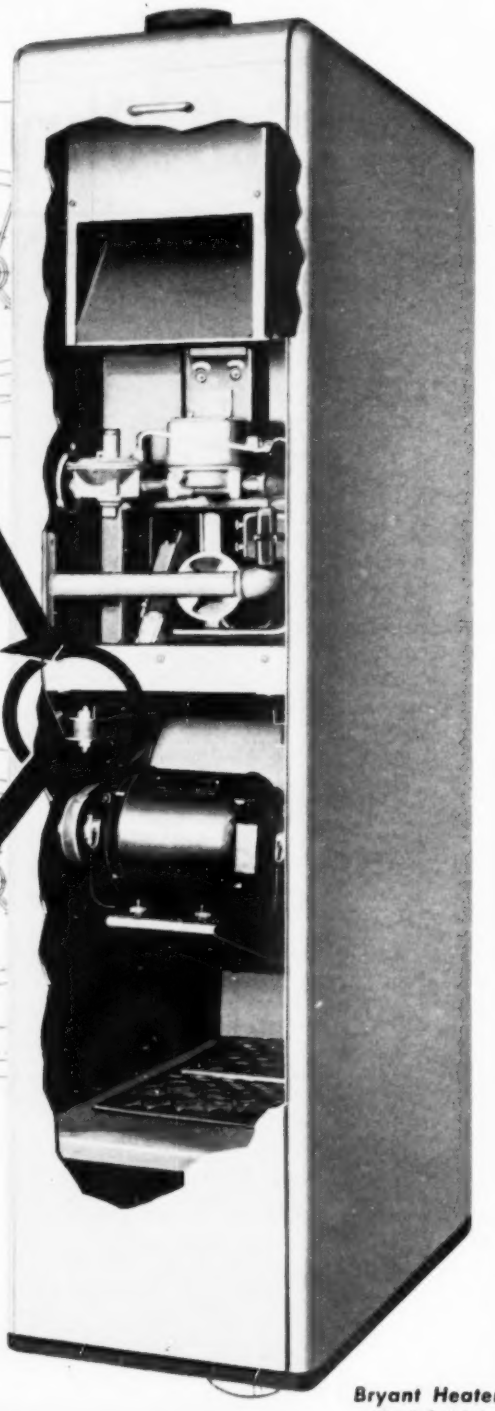

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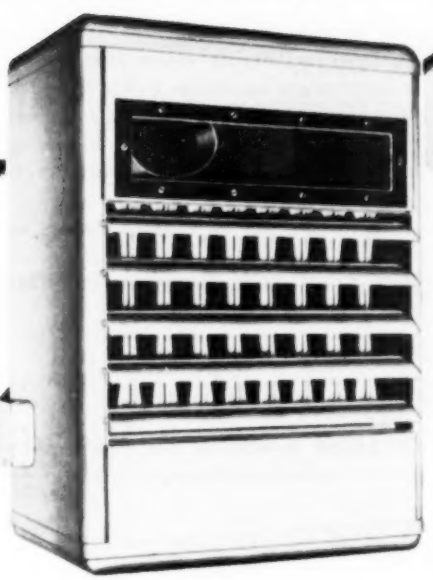

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Moncrief now offers you a complete line of Unit Heaters — in four sizes — with inputs from 60,000 to 170,000 BTU per hour. These sizes put any Unit Heater Installation within the reach of Moncrief Dealers.

Moncrief Unit Heaters are built by the same craftsmen who have made Moncrief a leader in the heating field for over fifty years.

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- Compact — requires minimum of headroom for installation
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HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

ASHVE PAPERS —

(*Continued from page 82*)

cooling conditions of operation. The principal variables are the flow rate (cfm); the temperature and velocity of the supply air; the location, type, and deflection setting of the supply outlets; and the location of the return intakes. Although the heating load, cooling load, and room size are presently being held constant, these factors may be introduced as variables later in the research program.

The research completed has involved several commonly used types and sizes of supply outlets installed at a single high sidewall location. Additional studies with supply outlets at other high sidewall locations are to be conducted later in the program, possibly after completing the current phase of the project which deals with floor registers of both the conventional and perimeter types.

Test Results Given

Test results indicate that an increase in the amount of air being circulated during winter heating causes a decrease in temperature variations within the room but does not cause excessive air motion in the occupied zone. This fact, it appears, might make it possible to successfully use the same air flow rate for year 'round air conditioning.

The research to date has led to the following conclusions:

- Free openings are unsatisfactory as high sidewall supply outlets for summer cooling.
- During the summer cooling studies, the location of the return intake has only a localized effect on the air distribution when both free openings and vaned outlets are used. The same trend was found during the limited number of winter heating studies conducted.
- At the same outlet velocity, the air motion in the occupied zone is much greater during cooling than during heating.
- Vertical temperature variations in the occupied zone during cooling were generally about 1 deg. whereas they had a much greater range during heating.
- The vertical-vane settings of the supply outlets have a great influence on the air distribution in the occupied zone during cooling, only a small one during heating.
- The horizontal-vane settings of the supply outlets affect the air distribution in the occupied zone during cooling, but do not affect it during heating.
- Gravitational forces due to the difference in the densities of the supply air and the room air have an extremely important effect on the air distribution during both cooling and heating.
- An increase in the flow rate during winter heating, with accompanying decrease in supply-air temperature, causes a decrease in the temperature variations within the room and a reduction of the room heat loss, but does not cause excessive air motion in the occupied zone. This indicates excellent possibilities of year 'round air conditioning systems successfully utilizing the same flow rate during both winter heating and summer cooling.

S. F. Gilman is Research Assistant Professor of Mechanical Engineering, University of Illinois.
H. E. Straub is Research Associate in Mechanical Engineering, University of Illinois.
A. E. Hershey is Advisory Engineer, Research Laboratories, Westinghouse Electric Corp.
R. B. Engdahl is Supervisor, *Battelle Memorial Institute*.

2. Friction Losses in Round Aluminum Ducts

By F. W. Hutchinson

FUNDAMENTAL INFORMATION necessary in the design of ducts for heating, ventilating and air conditioning systems includes data on air friction losses in the various types and sizes of ducts used. *The Heating, Ventilating and Air Conditioning Guide* contains friction charts which are widely used. However, the charts are based on a roughness factor applicable to round, galvanized sheet metal ducts having approximately 40 joints per 100 ft. In addition, The Guide includes a graphical means of applying a rational correction factor for use in connection with duct materials having a known surface roughness differing from the value used in the charts.

In practice, it is sometimes difficult to apply the correction factors, since the absolute roughness of the proposed duct material may not be known and a comparative estimate of the roughness may be very difficult. As a consequence, research work has been underway to provide accurate experimental data on some of the materials more commonly used in duct construction.

The limited experimental work confirms the roughness factor currently used for galvanized iron ducts and presents more comprehensive experimental results leading to the establishment of precise correction factors for use with The Guide's friction charts when aluminum is used as a duct material.

Results of this study indicate that aluminum ducts of standard construction present less frictional resistance than does the conventional galvanized sheet metal ducting. The advantage of aluminum is said to increase with velocity, and at high velocities, the size of an aluminum duct (for a fixed volume of air handled) would be approximately 10 per cent less than the required size of a galvanized iron duct.

Adequate information is not available for determining the possible increase of absolute roughness with diameter, but certain theoretical considerations suggest that a slight increase may be expected. With round duct and slip joints, the roughness responsible for loss of head is of two kinds: 1) roughness of the material of which the duct is constructed, and 2) roughness due to discontinuities of the internal surface at each joint. These two types of roughness superimpose and combine to establish the experimentally determined *absolute roughness*.

The roughness of the material would be expected to remain constant, but the joint roughness might well vary as a function of diameter — due to the fact that for fixed 3 ft length of sections, the number of diameters between joints decreases rapidly as the duct diameter increases.

F. W. Hutchinson is Professor of Mechanical Engineering, University of California.

3. Pressure Loss in 4 in. Diameter Galvanized Duct and Fittings

By H. G. Conn, W. G. Colborne and W. G. Brown

THE TREND toward the use of small round duct in warm air heating and air conditioning has increased the need of accurate values of pressure loss in these pipes and their fittings, especially in the fittings and combinations of fittings. This initial investigation deals with the pressure losses in 4-in. round duct and fittings such as would be encountered in heating and air conditioning work. This work was considered necessary due to the advent of 3½ in. and 4 in. diameter air distribution systems for which there was almost complete absence of published data on losses.

The pressure losses are given for four-piece adjustable elbows and for crimped elbows as well as for various combinations of these elbows. Losses are also given for various plenum take-offs and for registers and register boxes of varous designs.

Investigations were also made on runs of round duct which included several different fittings and the variations between the predicted losses and the actual losses were analyzed. The velocity profile between fittings was studied in an attempt to find an explanation of the variations.

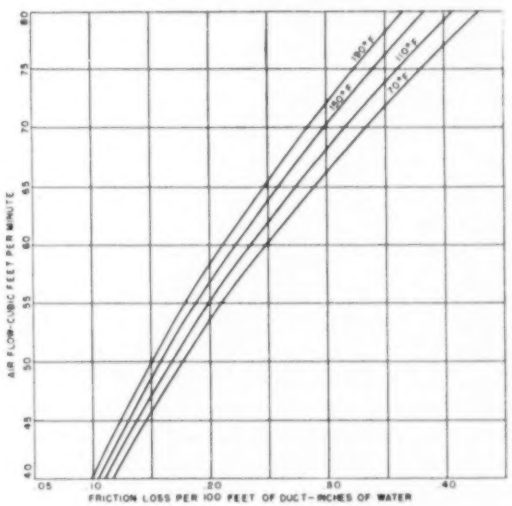
From the investigation, the following conclusions were indicated:

▸ The pressure loss in 4-in. diameter round duct as determined in these tests agrees with the values given in The ASHVE Guide in the range tested.

▸ A portion of the pressure loss attributed to an elbow occurs in the pipe following the elbow. The pressure loss of an elbow, therefore, depends partially on what fitting or pipe follows that elbow. The pressure loss of an elbow also depends on the velocity distribution in the stream entering the elbow and therefore depends on the fittings immediately before that elbow.

The equivalent length of one of the four-piece adjustable elbows varied from 5½ ft when used in combination with a register box to 11½ ft when used in combination with another elbow. The elbow, when tested singly, had a pressure loss equivalent to 11 ft of pipe.

▸ A recent proposal for stating the pressure loss in an elbow in terms of the surface roughness and the R/D ratio is unsatisfactory in cases where the elbow has joints or crimps. In these cases it is very difficult to estimate the surface roughness.



Friction losses for air flow in straight duct at various temperatures and 29.92 in. Hg barometric pressure

▸ The pressure loss expressed in equivalent feet of straight pipe is the most satisfactory method of evaluating the loss for a composite run. The actual pressure loss expressed in inches of water can then be found for various temperatures as shown in the accompanying figure.

▸ When two or more fittings are immediately joined the pressure loss should be evaluated, treating the combination as one single fitting.

H. G. Conn is Head, Department of Mechanical Engineering, Queen's University.
W. G. Colborne is Researcher, Queen's University.
W. G. Brown is Assistant Researcher, Queen's University.

4. Heat Transmitted to the Home From the Inside Chimney

By W. S. Harris and R. J. Martin

WHEN DESIGNING a heating system for a house it is common practice to assume that the room heat losses are a function of the indoor-outdoor temperature difference only, and that the sole source of heat input to each room is the room heating unit. Actually, while heat losses are primarily dependent upon the indoor-outdoor temperature difference, such factors as the direction and intensity of the wind and the amount of sunshine also have an effect on the actual heat loss. Moreover, the room heating unit is not the only source of heat input to the rooms. Heat is also obtained from such sources as lights, people, cooking, heating ducts and heat losses from the furnace and chimney. Early tests in a research home showed that about as much heat was supplied to the rooms by these "stray" sources as by the room heating units themselves. Furthermore, it was observed that those rooms through which the inside chimney passed were overheated even though the heat losses were estimated with extreme care and the Btu delivered was in accordance with the estimated heat loss. To correct this unbalance in room temperature it was necessary to reduce as much as 35 per cent the Btu input originally specified for those rooms through which the chimney passed.

These observations seemed to indicate that a rather large amount of heat was being transmitted through the walls of the chimney to the room air. This paper is confined to a discussion of tests made in a research home at the University of Illinois to determine the amount of heat supplied to the house in this way when the house was being heated by an oil-fired heating system. The results are compared with the results of investigations made at the National Bureau of Standards and at *Battelle Memorial Institute*. A method of allowing for the effect of chimney heat in the design of residential heating systems is suggested.

Conventional practice in the design of a heating system is to supply sufficient Btu to each room to offset the calculated design heat loss. Column 2 in the accompanying table indicates the number of sides of the inside chimney which are exposed to the different rooms. Column 3 gives the total calculated heat loss of each room. Column 4 is the allowance for heat obtained from the chimney (taken as 1.5 per cent of the calculated heat loss of the house for each side of the chimney exposed to the room), and column 5 represents the net heat to be provided after making allowances for the heat obtained from the chimney.

Using the conventional procedure, the Btu supply would be selected in accordance with the values in column 3. By the procedure suggested in this paper the Btu supply would be selected on the basis of the values in column 5.

The heat obtained from the inside chimney was sufficient to take care of from 11 to 30 per cent of the normal heat requirements of the rooms to which the sides of the chimney were exposed.

Results obtained when a room by room heat gain was measured in a two story home using an inside chimney

Room	No. of Sides of Chimney Exposed to Room	Calculated Heat Loss Btu per hr	Heat Obtained from Chimney Btu per hr	Net Heat To be Supplied Btu per hr
(1)	(2)	(3)	(4)	(5)
Living Room	1	5740	650	5090
Dining Room	2	8742	1300	7442
Kitchen	1	3190	650	2540
Lavatory		1484		1484
Vestibule		4848		4848
Vestibule Closets				
N.E. Bedroom		4393		4393
N.W. Bedroom	1	4944	650	4294
S.W. Bedroom	2	5250	1300	3950
Bath		2606		2606
Stair	1	2155	650	1505
Closets				
Total		43,370	5,200	38,170

W. S. Harris is Research Professor of Mechanical Engineering, University of Illinois.
R. J. Martin is Associate Professor of Mechanical Engineering and Associate Director of Engineering Experiment Station, University of Illinois.

A.C. — Life Saver for Baby Chicks

THE LIVES OF thousands of newly hatched baby chicks are being saved every year by an air conditioner that Morris Gray has installed in his hatchery at Rossville, Indiana, according to the Frigidaire Div., General Motors Corp.

Mr. Gray owns and operates two poultry farms, plus the hatchery at Rossville, where he hatches about 30,000 chicks a week throughout the year. Before he installed the air conditioner in his hatchery, he was losing many baby chicks every summer in the incubating rooms through heat suffocation.

Finally he decided to cool his incubating rooms by installing an air conditioner. After a dealer in a nearby town estimated the amount of cooling needed, a 5 hp unit was installed.

Since that time, there have been no chicks lost due to heat suffocation. The incubating rooms are kept at the desired temperature and humidity all summer long. Also dirt and dust are kept out by the filtering action of the unit.

Mr. Gray reports that several neighboring hatcheries, in addition to many in the east, had heavy losses during the last hot weather season, and he feels these losses could have been avoided with the use of air conditioning equipment.

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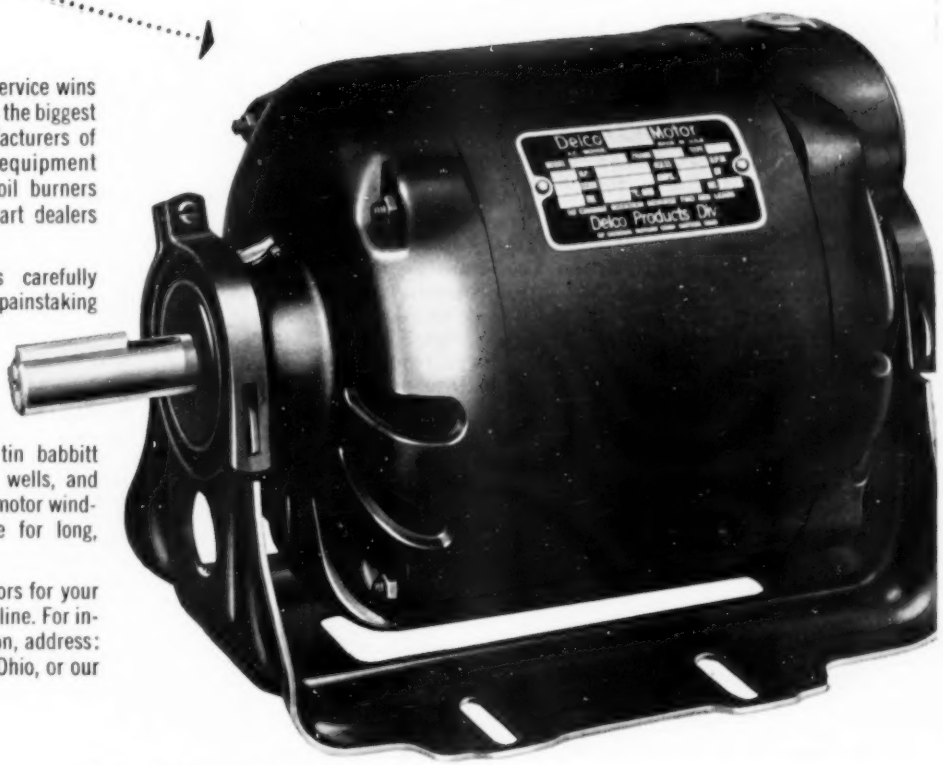

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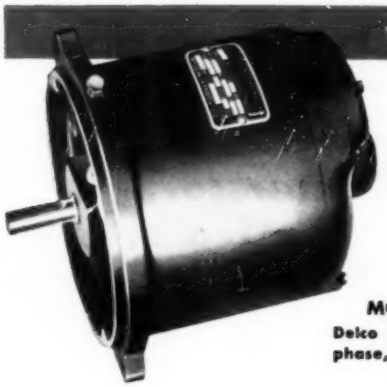

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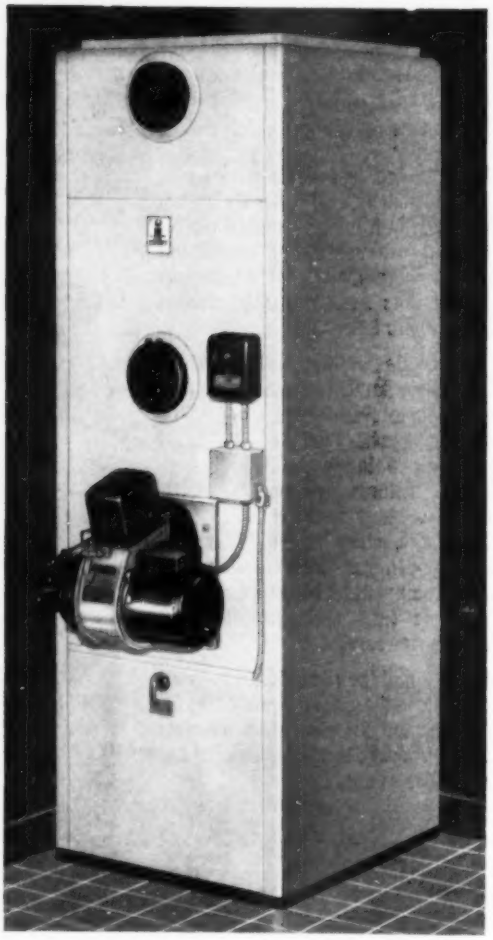
For example, these new OIL HI-BOYS — specially engineered for use in the modern basementless home — have more than a *dozen* quality and performance features that you can demonstrate. They're easier to install *after* you've sold them, too — because they are completely assembled at the factory, ready for immediate installation. Better see *your* International Economy distributor — TODAY!



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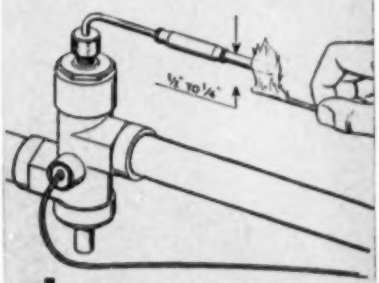
Testing the BASO Hood Assembly with the No. 239-1 Test Couple



1. Turn off the main burner and pilot.

2. Disconnect the thermocouple from the Baso valve and attach the test couple to the hood assembly so that the thermocouple is in a horizontal position.

3. Hold one lighted wood safety match or two lighted paper safety matches ¼" to ½" below the end of the Test Couple for a period of 10 seconds and reset the control immediately. The Test Couple should develop 8 to 10 millivolts (open circuit reading) within the 10-second period. If the control holds open, it is in good operating condition.

If the control will not hold open, it can be considered inoperative, and the hood assembly should be replaced with a new unit.

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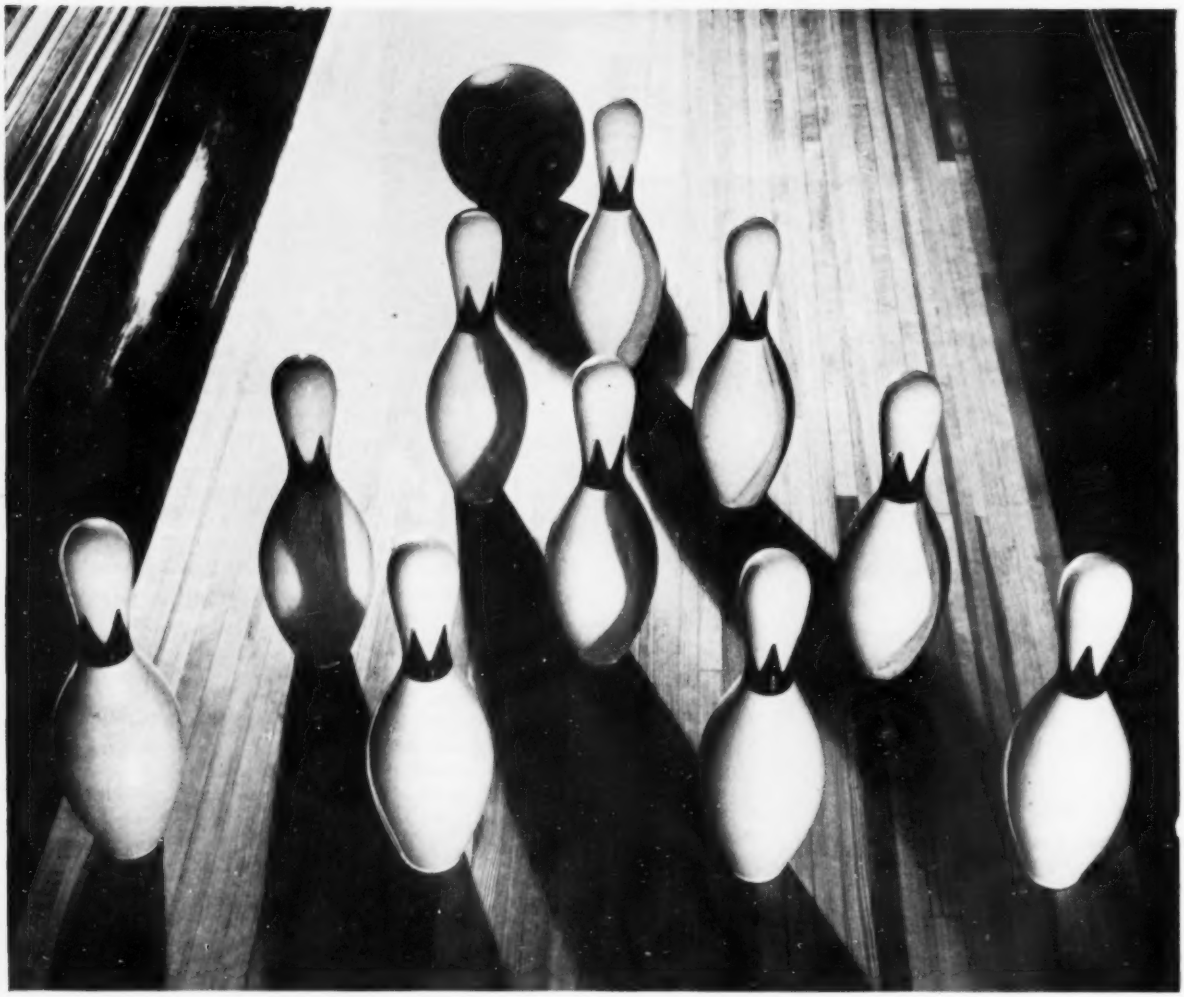

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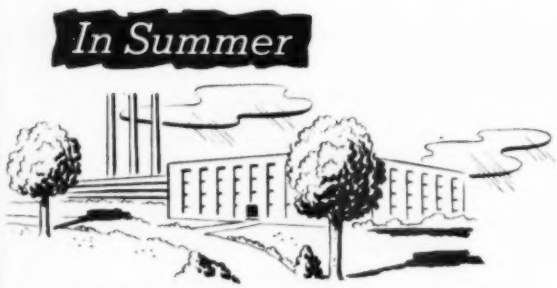

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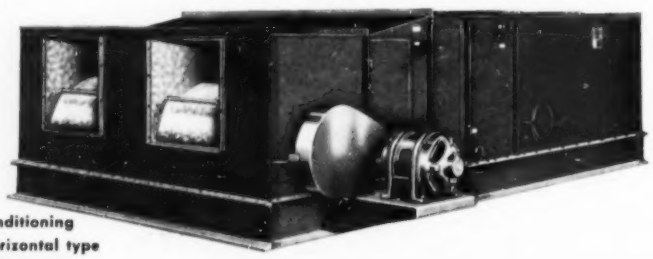

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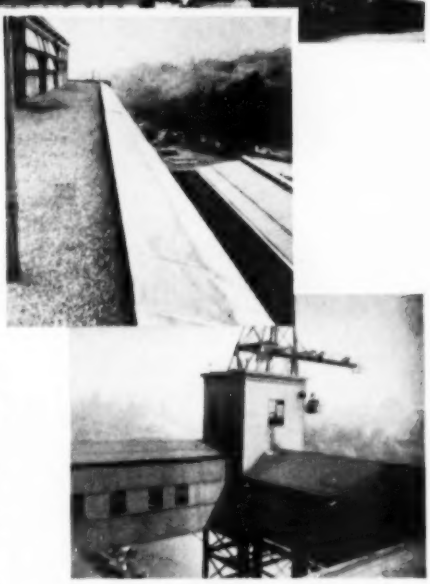
...for a roofing sheet that's still going strong

Long-Lasting and Trouble-Free. Monel cap flashings installed on roof of Consolidated Edison Company's Sherman Creek Plant in 1913 are still in good condition.



Excellent Corrosion-Resistance. Siding, roofing, gutters and leaders are Monel on the Sherman Creek coal hoist. The 40 years of severe service that this installation has seen have had little or no corrosive effect.

You might think a roofing sheet would be getting pretty run-down after 40 years.

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Yet, after all the years under such corrosive and abrasive conditions, the Monel roof surfaces, coal hoist siding, downspouts, flashings and skylight frames are still in good condition — still ready for more years of the same tough assignment.

That's why roofers can be glad to see Monel specified today. When a Monel roof goes up, their reputation goes up with it.

They know that it stands firm against strain and flexure — doesn't buckle or crack — resists stresses, wear and abrasion.

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Inco Nickel Alloys

Monel... *for the life of the building*

EQUIPMENT DEVELOPMENTS —

(Continued from page 125)

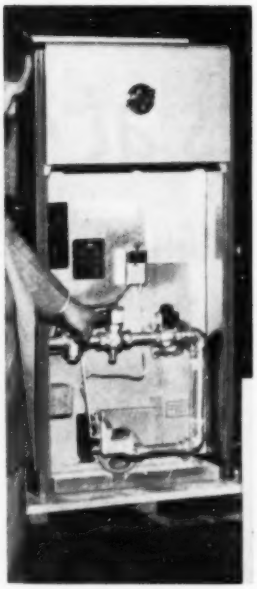
placed in a notched pan to prevent tipping. A model without plates is available for small sized homes or for use during the first year in new homes. AA 8

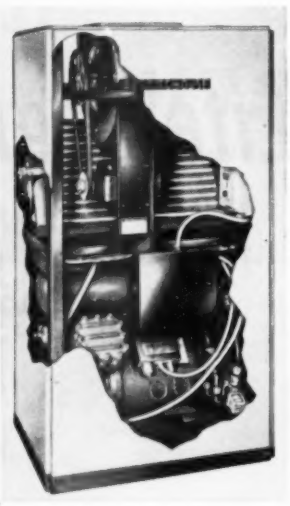
Window Type Air Conditioner

RAPIDAYTON ROOM AIR CONDITIONER, in ½ and ¾ ton models — Dayton Pump & Mfg. Co., Dayton. The larger model is designed to control temperatures in an area of up to 485 sq ft, extends 13½ in. into the room. Controls are recessed into the top door of the cabinet. AA 9

Gas Fired Lowboy Furnace

MODEL LMD-100 LOWBOY, gas fired furnace, featuring the Magic-Heet principle by which automatic adjustments of heat input and air circulation compensate for constantly changing heat requirements in the home — A. O. Smith Corp., Milwaukee. The temperature of the room air is taken constantly, and the flame is automatically adjusted higher or lower as needed. The model weighs 430 lb, has a 10 in. blower and is powered by a ¼ hp motor. It modulates input from 100,000 Btu to as low as 40,000 Btu, the company states. Bonnet output ranges from 80,000 to 32,000 Btu, and register output from 68,000 to 27,200 Btu. Discharge ranges from 1150 to 765 cfm at 90 F. The unit is 43⅝ in. high. AA 10





Above: Conditioner
Left: Furnace

Home Air Conditioners

UNITAIRE CONDITIONERS for the average size home, which can be used alone or in conjunction with a forced warm air heating system — Westinghouse Electric Corp., Air Conditioning Div., Hyde Park, Boston. Units are avail-

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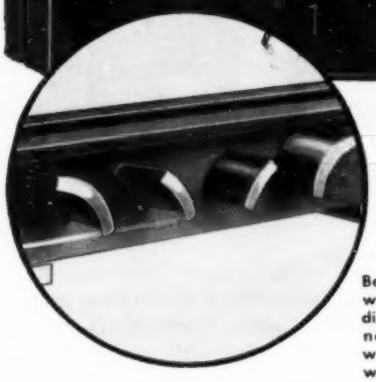

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Engineering data on this new diffuser proves its amazing high air control efficiency. (See our new 1953 catalog which shows Iso-vel patterns CFM, & pressure requirements, smoke patterns, etc.)

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For any type forced warm air heating system. Made of heavy duty 20 gauge steel.

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SHEET METAL MACHINERY

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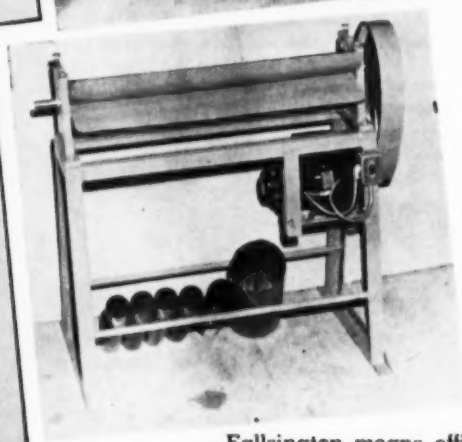
▲ Above: the new ▲ Fallsington Die ▲ Press

◀◀◀ Left: HX 36 Husky Press.



◀◀◀ Left: PR 36 Power Roller with Crimper & Beader attached.

Fallsington means efficiency! Illustrated above are just three of the units which will put your shop on a real production line basis. The Fallsington die press is similar in construction to the Fallsington Husky Press, except that it is much larger with a much more powerful motor. The Husky press is available in two models, H24" and H36". Bed area is 8" x length of machine. Roller PR 36 rolls smoke pipe or ducts from 3" to 10" without crushing lock on smoke pipe. Lock is first made on the Husky Press. Please write us for more information.

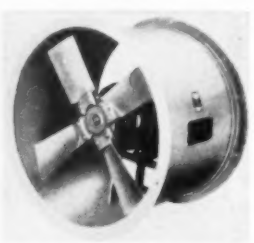
FALLSINGTON MFG. CO., Fallsington, Pa.

able in two models. The 3 hp size is 5 ft high, 28¼ in. wide, and 21-9/16 in. deep. It is available with or without fan assembly, with bottom or back return air inlet. The motor is available for 208 or 220 volt, 60 cycle, 3 phase, or 230 volt, 60 cycle, single phase current. It can be thermostatically controlled. The 5 hp model is slightly larger. Both sizes have a hermetically sealed motor compressor unit with a refrigerant cooled motor, and may be located in a closet or other out of the way location, since they absorb their own heat. AA 11

Rivet Operated without a Dolly

POP RIVET designed to handle "blind" spots as easily as open sections, which can be driven without a dolly — J. C. Rhodes and Co., New Bedford, Mass. Available only in monel and aluminum, it can be used to fasten most commercially available metals and alloys. The fastener consists of the rivet itself, and an inserted mandrel resembling a finishing nail. The mandrel and rivet are slipped either into pre-drilled holes, or into the fastening tool and then into the hole. Fastening tools can be operated manually and pneumatically, and can be fitted with various heads and extensions. The collet of the tool grips the shank of the mandrel and pulls, while the nose of the tool presses against the rivet head and holds it clamped against the face of the section to be fastened. At the same time, the collet pulls the shank of the mandrel, expanding the inside end of the rivet to fasten it tightly against the inside surface of the work. This draws sections of the work together, clinching them. AA 12

Rivets and Tool



Duct Fan

Direct Drive Duct Fan

POWER LINE Type PLFX direct drive duct fan — Chelsea Fan & Blower Co., Inc., Plainfield, N. J. The fan is built into a steel drum with rear and front mounted flanges. Motors are ball bearing, totally enclosed. Blades are non-overloading, made of cast aluminum. The fan is recommended by the manufacturer for temperatures up to 110 F, and is available for higher temperatures on special order. Sizes are 16 to 48 in., in 2900 to 37,500 cfm capacities. AA 13

Insulating Duct Liner

FLEXIBLE INSULATING MATERIAL for lining the interior of air conditioning or warm air ducts — Owens-Corning Fiberglas Corp., Toledo. It is designed for high noise reduction efficiency and has high thermal insulating properties, the manufacturer states. When used inside

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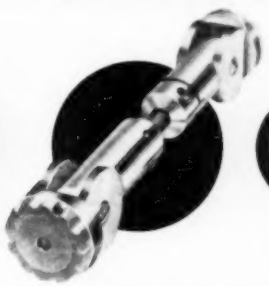

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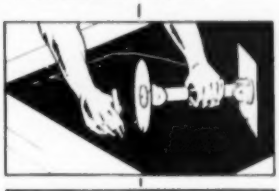

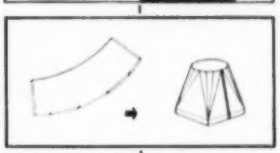

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NEW Mueller Climatrol Type 910 Recessed Summer Conditioners

Everywhere it's been shown — the NAHB Show, the Heating and Ventilating Show — this brand-new system of home cooling, the Mueller Climatrol Type 910, has created the kind of enthusiasm that results in *orders!*

Now they're rolling off the Mueller production line to satisfy the many builders and dealers who realize that this completely new principle is the coming thing in home cooling.

Easy to install, the Mueller Climatrol Type 910 just slips in between two standard stud spaces. It's air-cooled; no water or plumbing connections necessary. The unit is self-contained, neat, attractive, efficient. When installed, its projection into the room is less than nine inches — doesn't disturb normal furniture arrangement.

It will pay you to hop on the band wagon *now*. We're doing the best we can to keep up with the demand. Write us for full information. And order a display model of the new Type 910 Recessed Summer Conditioner *right* away.

Heating and Cooling for Year 'round Comfort

You can look to Mueller Climatrol for nearly every cooling need, residential and commercial.

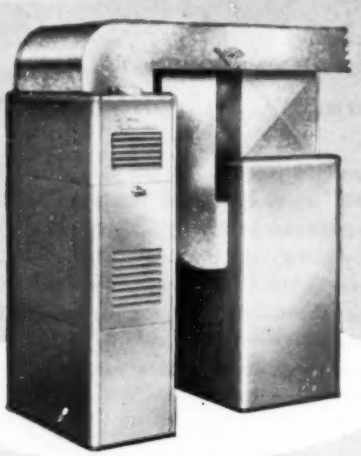
There's the Type 901 Summer Air Conditioner in 3, 5, and 7½ ton sizes for use with Types 105 and 108 Gas-fired and Type 202 Oil-fired Winter Air Conditioners.

The Type 904 Self-contained Cooling Unit is for stores, restaurants, or for use with duct systems in homes with radiator or radiant heat.

The Type 903 Self-contained Cooling Unit can be installed with any kind of warm-air winter air conditioning system, or it can be used for added cooling in existing systems. Sizes: 2, 3, and 5 tons. Here it is illustrated with a Mueller Climatrol Type 110-80 Gas-fired Winter Air Conditioner.

96th Anniversary

Write for a copy of the new *Mueller Climatrol Cooling Manual* — for fundamentals and facts on figuring and laying-out summer air conditioning systems.



Type 110-80 Gas-fired Winter Air Conditioner + Type 903 Self-contained Cooling Unit

D-141

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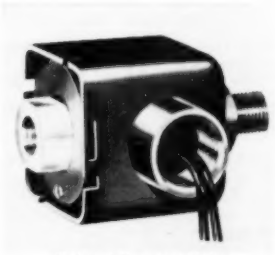
ducts, it allows the metal surface to act as a vapor barrier, preventing condensation on those ducts carrying cool air through areas of high humidity. Being flexible, it may be installed on metal sheets before they are bent to form ducts. The insulation is sprayed with a light coating of neoprene to prevent erosion by high velocity air and to reduce frictional losses. AA 14

Delayed-Opening Valve

DELAYTROL DELAYED-OPENING valve, a unit complete in itself, available as an accessory for installation in the nozzle line of oil-burning installations — Webster Electric Co., Racine. It delays the delivery of oil to the nozzle for six to eight seconds on cold starts, allowing the motor to come to full speed, the company states. This establishes full draft and is designed to assure complete atomization and the proper amount of air for combustion. On the shutdown, the unit provides instantaneous cutoff by extinguishing the flame while the draft fan is still operating at full speed. The valve is designed to provide heating economy, since gases are more completely exhausted and combustion is maintained at a higher peak of efficiency, according to the manufacturer. It operates normally closed in any position. The "straight-through" design permits mounting directly on the fuel unit or at any point along the nozzle line. AA 15



Delayed-Opening Valve

Combustion Analyzer

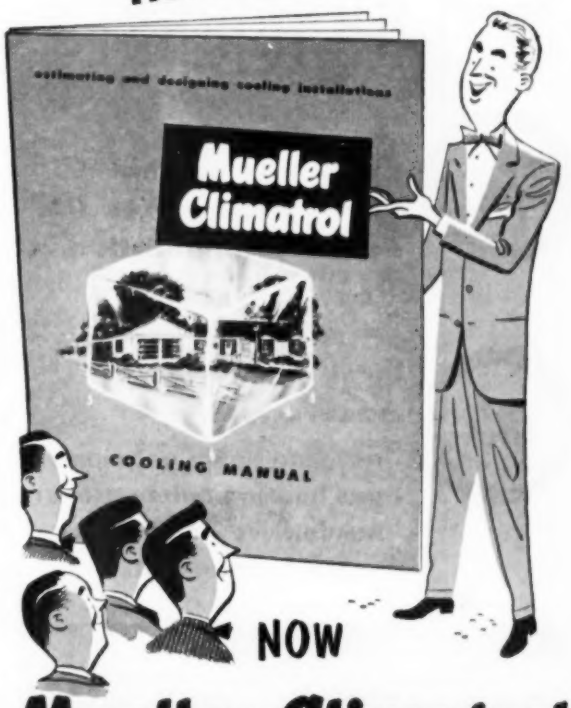
Combustion Analyzer

MODEL 140-C PORTABLE, all-electric complete combustion analyzer, which measures per cent of CO_2 (0 to 20 per cent), temperature (100 to 1000 F), and draft (0 to 0.3 in. water) on one meter — Victory Engineering Corp., Union, N. J. A dry cell battery powers the device, which incorporates a glass coated electronic thermistor, gas analysis cell, filter-drier, compensated thermocouple lead, and two 30 in. probes. A series of readings may be taken without moving the probes. AA 16

Power Press Counterbalance Cylinders

LINE OF POWER PRESS counterbalance cylinders designed for installation on punch presses or power brakes and similar equipment — The Dayton Rogers Mfg. Co., Minneapolis. Counterbalancing of the power press ram gives a smoother action and decreases wear on the ram clutch mechanism. The cylinders serve as a brake, eliminating the over-riding of the ram on mid-stroke, and absorbing the percussion shock or blow of the punch

New Cooling Manual Hot off the Press



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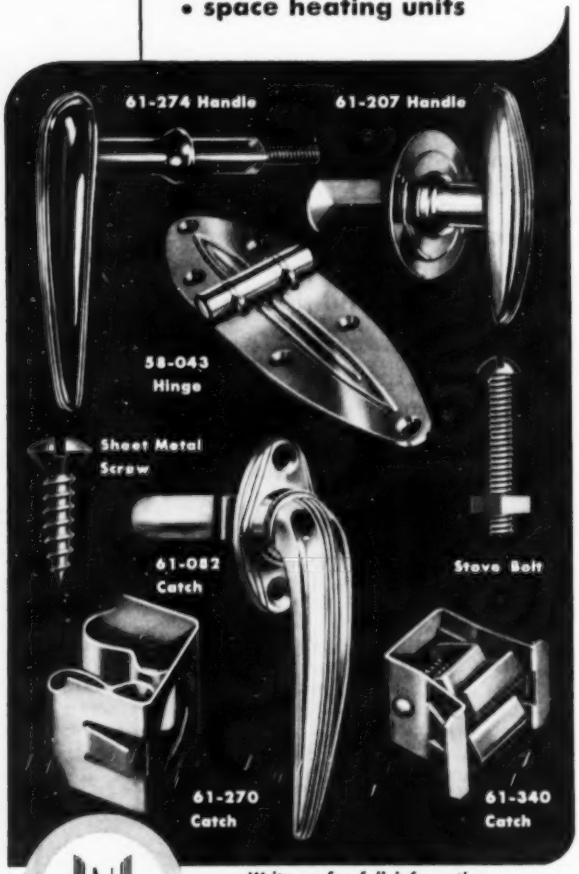

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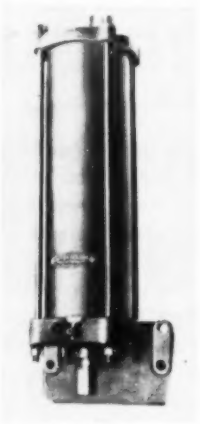
presses when the punch section of the die breaks through the blanking operation, according to the manufacturer. The cylinders are now available in sizes from 5 to 12 in. AA 17


Cylinder

Incinerator

Incinerator for Residential Use

CLIMATROL INCINERATOR with 1.6 bushel capacity, designed to take care of the average family's daily garbage and waste disposal — L. J. Mueller Furnace Co., Milwaukee. It provides continuous operation, with 1700 Btu input per hr. The incinerator is designed for basement or utility room installation (it is 18 in. wide, 36 in. high, and 24 in. deep). It employs a dehydrating process in disposing of waste, first drying the material and then burning it slowly. A fine white ash collects in a receptacle at the bottom which needs emptying every 20 or 30 days, the company states. The access door is on top. The gas burner is so designed that waste material cannot come in contact with the flame to extinguish it. AA 18

Suspended Gas-Fired Unit Heater

SUSPENDED GAS FIRED unit heaters, suitable for natural, manufactured, mixed, LP, sewage, or coke-oven gas, and available with input capacities ranging from 85,000 to 215,000 Btu per hr — Dravo Corp., Pittsburgh. Models are available with standard fan, with squirrel-cage blower for short duct runs, and without blower (to be built directly into air conditioning duct systems). The bunsen type burner assembly can be removed for servicing. Units are designed to give supplemental heat in commercial buildings and small office areas. AA 19

Oil Burner Controller

MODEL C-502 OIL BURNER CONTROLLER which, mounted in the stack, automatically starts the oil burner in response to thermostat demands, and keeps it running as long as heat is needed — Iron Fireman Mfg. Co., Cleveland. A built-in safety switch gives protection against ignition or flame failure. If the power supply lapses, the controller automatically recycles and begins normal burner operation when power is restored. The controller is actuated by a bi-metal element. Relays are rated for heavy duty, and contacts are of pure silver. The ratchet-

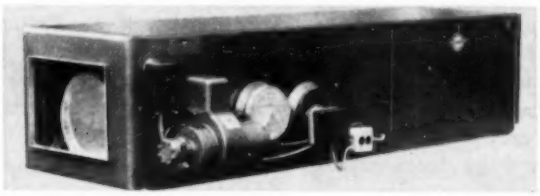
Horizontal Furnaces Opening New Profit Opportunities

Heating Contractors Help Builders Beat Rising Costs and Make Money Doing It

Keeping the cost of new homes within the reach of potential buyers is a major problem today. Builders and contractors are meeting it in two ways: First, to beat the high cost of single lots, they are developing large tracts of land and building many homes at the same time. Second, they are eliminating every possible costly feature — basements, garages, even service rooms.

New Furnace Opens New Field

This is opening up a whole new field of opportunity for the heating and sheet metal contractor—the sale and installation of underfloor central warm air heating systems. The sensational NEW "Besser Junior" makes central heat possible in even the lowest cost homes.



The Besser Horizontal Furnace Needs No Basement or Utility Room — Can be Installed Under-floor or Overhead

Because of the great savings, more and more builders are turning to the new type horizontal, oil-burning furnaces. A central heating system adds value to any house, makes it easier to sell—is far superior to floor furnaces. Now, the NEW "Besser Junior" brings central heat within every price range.

Here's Where Profits Are Made

Bidding on the big jobs is always competitive, so where do you come in? Here's the answer: to start with, you've got something to sell—the answer to a builder's prayer—a way to put central heat into every house without the cost of a basement or utility room. That's a natural advantage. Now, the cost is lower than ever.

Still, you may have to figure closely, so where's your profit? Right here! Service call-backs are what eat up your profit. When you install a Besser Horizontal, service calls are fewer—far fewer—because only the best goes into a Besser! Properly installed, it's virtually trouble-free. Call-backs will be few and far between. Every Besser is fully guaranteed . . . because it's built to last!

Besser Plant Facilities Expanded 50% to Meet Growing Demand

Double Sales Possibilities

Quiet, automatic Besser Horizontals are equally adaptable to overhead installation on commercial jobs where floor space is at a premium. One furnace gives you a double sales potential. Full range of sizes to meet every job need—delivered to you assembled, ready to install.

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Greatly expanded plant facilities make it possible to serve a larger area. Distributor franchises and dealerships in certain areas offer a real opportunity for profit in a product you can sell with confidence. Inquiries from aggressive Manufacturer's Agents invited. For full information write: Besser Metal Products Corp., 754 Clement Ave., P. O. Box 4064, Charlotte, N. C.

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When you order "Valley Tin" or "Roofing Tin," you *mean* Follansbee Terne Metal, and *that's what you should insist on getting!* There is no substitute for Terne Metal's easy application, long life and flexibility whenever metal is used.

Follansbee Terne Metal has the tensile strength of steel plus the extremely high corrosion resistance of lead. It has been produced by Follansbee for more than 60 years. You've probably used it time and again as "Valley Tin" or "Roofing Tin"—for roofing and weathersealing, termite shields and cold air return ducts.

Sheet metal men everywhere recognize these advantages of trouble-free Follansbee Terne Metal:

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- **Tough, durable, fireproof.**
- **Unlimited design possibilities—variety of color harmony.**
- **Elimination of cross seams.**

Unlike other metals which are sometimes used for weathersealing as well as roofing, Follansbee Terne Metal expands and contracts so little with changes in temperature that it needs no expansion joints, regardless of the length of run.

Leading distributors are prepared to supply you with this high quality Terne Metal in 40 lb., 20 lb. and 8 lb. coatings. Be sure to specify Follansbee Terne Metal the next time you need "Valley Tin" or "Roofing Tin."

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Ohio Valley Hardware & Roofing Company
METAL MANUFACTURING DIVISION, EVANSVILLE, IND.

ing mechanism assures positive control of the sequences of burner operations, the company states. AA 20

Above: Conditioner

Left: Controller

Room Air Conditioners

WINDOW TYPE room air conditioners in ½ ton, ¾ ton and 1 ton capacities — Frigid Inc., Brooklyn. Thermostatic control is provided for variable cooling. Units cool, dehumidify, filter, circulate, exhaust and ventilate. Louvers are adjustable for any direction. The control panel is concealed. Cooling capacities are 200 to 300 sq ft for the ¼ ton unit, 300 to 400 sq ft for the ¾ ton, and 400 to 600 sq ft for the largest. AA 21

Summer Air Conditioners

TWO NEW MODELS of summer air conditioners which are intended for new or existing homes heated by warm air furnaces — U.S. Radiator Corp., Detroit. One model is

designed for installation in connection with basement-type warm air furnaces; the other, for attic and utility room installations. Conditioners are available in 2, 3, 5 and 7½ ton units. AA 22

Combustion Head for Oil Burners

COMBUSTION HEAD applicable to any oil burner up to a capacity of 3 gph. and designed to produce a high efficiency "sunflower" flame or to be adjusted to a different type of flame which will correct pulsating conditions — Boston Machine Works Co., Lynn, Mass. The anti-pul-

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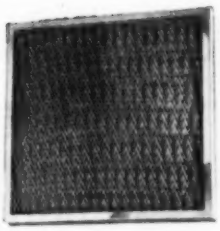

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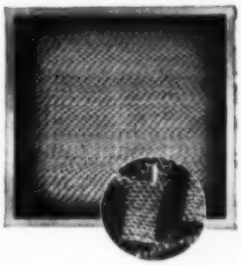
Has a specially designed high velocity Viro-Crimp filter core. Hemmed edges provide a safety feature. Operates efficiently at 300 to 500 fpm. Available in 2" and 4" thickness.



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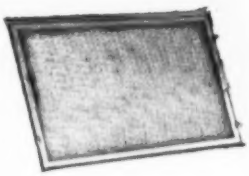

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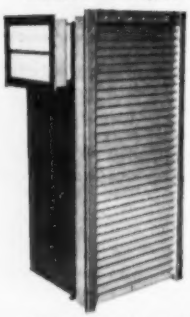
Model 8201. 14,000 BTU/hr. input. 18½" x 25" x 5".
Model 8202. 20,000 BTU/hr. input. 18½" x 37" x 5".
Model 8203. 30,000 BTU/hr. input. 18½" x 48" x 6¼".



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Model SFO-70. Oil fired. 52,600 BTU/hr. output. 20¼"x24"x53¾".

Model SFG-70. 70,000 BTU/hr. input with natural, manufactured and mixed gases. 64,000 BTU with LP gases. 20¼"x24"x50¾".

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sating flame is also a high efficiency flame, the company states. The head has an adjustable shutter-arrangement that permits the installer to obtain the desired type of air pattern from the burner and cone. AA 23

Central Cooling Unit

CENTRAL COOLING UNIT in 2 and 3 ton sizes, designed for easy access to all elements — Iron Fireman Mfg. Co., Cleveland. Any part can be serviced on the job without requiring removel of the entire unit. A thermally activated multiple feed expansion valve is included, and a receiver is provided for a supply of "Freon 12". The

condenser can be connected to a city water system or a cooling tower. The spring-mounted compressor is isolated from refrigerant lines by vibration eliminators. Protection is afforded by a thermal overload device and a high-low pressure control. A thermostat or humidistat is electrically connected with the solenoid valve. Units measure 22 x 37 x 47 in. AA 24

Wall Stack

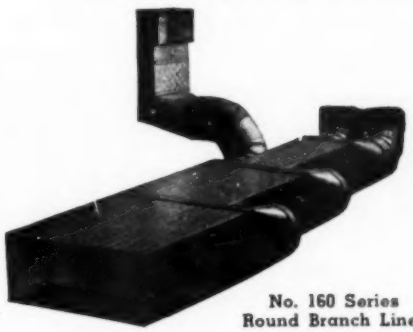
ONE PIECE, RECTANGULAR WALL STACK which is installed without the use of tools — Superior Metal Fabricating Co., Niles, Ohio. It can be assembled by inserting the tongue of one edge into the fold of the other. When it snaps into place it is ready for use. No malleting is necessary. To connect fittings or runs of stacks, one piece is pressed on the other until it snaps into place, making a permanent installation. The wall stack can be cut to desired lengths without damaging the Spee-D-Lok feature. AA 25

Flue Gas Detector and Alarm

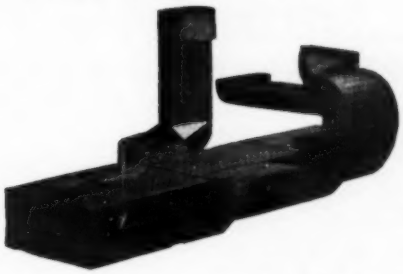
FLU-GAS-TAT SAFETY DEVICE designed to detect flue gas and carbon monoxide spillage in residential heating systems — Maxwell, Inc., Denver. It is installed on the vent pipe of the heating plant, immediately after the draft diverter, and will shut off the burner and sound an alarm when the flue gases are blocked and spilling into the furnace room. AA 26

GRAY *"Snap-Rite"*

FURNACE PIPE AND FITTINGS
AIR CONDITIONING PIPE AND FITTINGS



No. 160 Series
Round Branch Lines



No. 170 Series
All Square Lines

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3¼" standard depths. Truck Pipe and Fittings in 8" standard depths.

Write for Catalog

GRAY METAL PRODUCTS, INC.

30 Carlton Street — Rochester 7, New York

Darling it's so exciting . . .

I just can't wait

to see those sensational, new

STANDFORATED

Perimeter Baseboard Registers

WITH SLIDING DAMPER CONTROL

Write Now for Your Free Copy of Standard's Amazing New Pocket Catalog

- Used in homes, schools, churches and commercial installations.
- Comes in four foot sections.
- Simplifies balancing of heating systems.
- Fabricated of 20 gauge steel.
- Finished with Prime Coat only—special finishes on request.

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5-53

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Combination Shear, Punch and Coper

A COMBINATION SHEAR, punch and coper for shearing plates, angles or bars; punching in or coping angles; and notching, cutting and mitering is described and illustrated in a 10 page bulletin — Kling Bros. Engineering Works, Chicago. Included is detailed engineering data on capacities and specifications. AA 101

Duct and Fittings

CATALOG GROUPS standardized duct and fittings according to category of use in heating systems — The Clayton & Lambert Mfg. Co., Louisville. The catalog gives sizes, weights, and list prices of all fittings, and includes illustrations of seven types of heating systems. AA 102

Extruded Aluminum Louvers

EXTRUDED ALUMINUM LOUVERS fabricated to any size, depending on architectural or structural requirements, are described in an eight page booklet — Lou Sommerfeld, Inc., New York. Included are stationary, adjustable, self-closing and dual combination types. AA 103

Air Conditioning Sales Aid

FOLDER PRESENTS an investment analysis technique developed to help determine how the installation of air conditioning can help boost the income of stores, restaurants, and other small commercial establishments — Air Conditioning Div., General Electric Co., Bloomfield, N. J. Tables give the typical number of days requiring air conditioning in various cities, typical gross margin in various businesses, and typical sales increases reported. AA 104

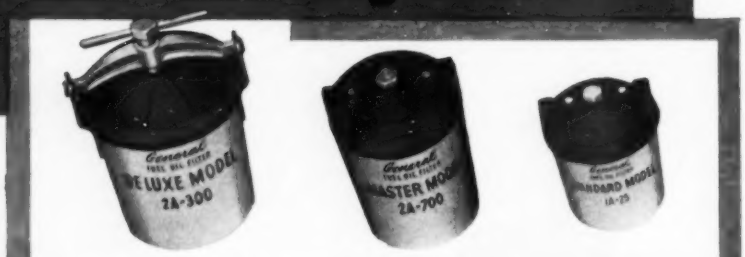
Oil Burner Controls

CONTROLS for all makes of home oil burners are illustrated in an eight page circular — General Electric Co., Schenectady, N.Y. Included are room thermostats, flame detectors, transformer relays, etc. AA 105

General FUEL OIL FILTERS

For Any Fuel Oil Heating Plant

Easy, Sure Service Profit Wherever Fuel Oil Is Used



DELUXE MODEL 2A-300	MASTER MODEL 2A-700	STANDARD MODEL 1A-25
For BIG DIRTY TANKS	For MEDIUM NEEDS	For SMALL HOMES, SPACE HEATERS, ETC.

You can be sure of *continuous* profit when you install a GENERAL. Wherever fuel oil is used, GENERALS prevent clogged burner nozzles, provide clean, steady oil heat, and insure quick cartridge replacements that mean easy service dollars for you

- Easy cartridge replacements each season.
- No more troublesome service "call-backs."
- Satisfied fuel oil customers year 'round.

FASTEST, SUREST FILTERING KNOWN
CLOGGED BURNER NOZZLES ELIMINATED
ALL-WOOL CARTRIDGE TRAPS FINEST PARTICLES
JUST TWO PIPE CONNECTIONS REQUIRED

CLEAN RIGHT SOOT REMOVER
Soot deposits also raise fuel costs! Clean Right burns safely, gently—leaves no residue. Made for General Filters, Inc.

General Filters carry this Underwriters' Laboratories Seal

GENERAL FILTERS INCORPORATED
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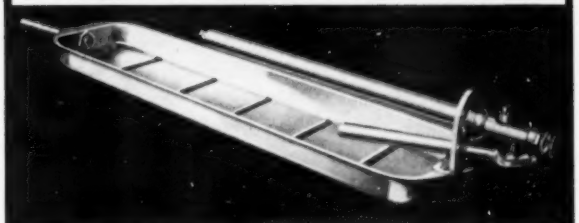
DETROIT 23, MICHIGAN
CANADIAN FACTORY BRANCH: CANADIAN GENERAL FILTERS, LTD., 2679 DANFORTH AVENUE, TORONTO 13, ONTARIO

MORE PROFITABLE TO INSTALL

THERMO-DRIP *Automatic* HUMIDIFIER



- VALVES DON'T LIME UP
- SUPER-SENSITIVE THERMOSTAT
- NO STAGNANT POOL TO REHEAT
- OUTSIDE SCREW ADJUSTER
- EASY INSTALLATION
- ONE KIT TO PURCHASE

Our volume sales prove it... Thermo-Drip gives furnace owners greater customer satisfaction.

Prospects easily see the advantages of humidifying by automatically dropping water on a sizzling hot stainless steel pan.

Too, it's easy to demonstrate why this method is the *most efficient, most dependable* way to put moisture in the air.

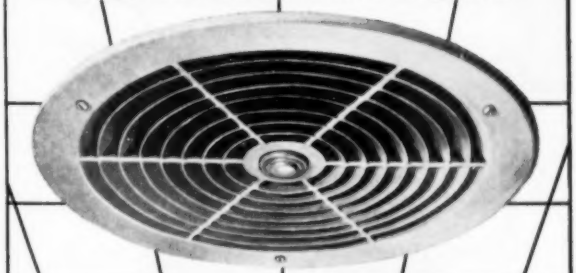
Yes—Thermo-Drip gives *faster, most efficient vaporization.*

Write today for FREE literature. Dept. A-53

Automatic Humidifier Co.
CEDAR FALLS, IOWA

H&C CEILING DIFFUSERS

TRY ONE and... YOU'LL WISH



REAR VIEW, SHOWING REMOVABLE FLANGE

YOU HAD DISCOVERED THEM *SOONER!*

That's what dozens of installers have told us. And it's not only because they save time and money by being so easy to install, but because they are so outstandingly efficient. Designed for rapid diffusion at high level to avoid disturbance to room occupants, they are ideal for residential and small commercial heating and cooling installations; and their effective area is so large that they may be used with standard residential package heating units. Removable flange assures easy, time-saving installation. Sponge rubber gasket seal prevents streaking. Available in 5 sizes.

No. 19 DAMPER KIT
everything necessary for providing ideal control of air flow.

See your H&C Jobber and the complete engineering data in our current catalog — No. 52.

HART & COOLEY MANUFACTURING CO.
500 EAST EIGHTH ST. HOLLAND, MICHIGAN
In Canada — Hart & Cooley Manufacturing Co., Fort Erie, Ontario

REACH OUT FOR MORE SALES WITH Radiant

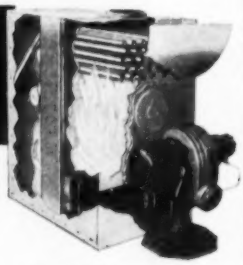
A Complete Line from ¾—30 Gals. Shell Head Models ½—10 Gals.

RESIDENTIAL
COMMERCIAL
INDUSTRIAL

Every PROFIT Reason Says—BUY RADIANT!

Performance—Equal to the highest priced burners.
Price — Meets competition every time . . . *plus* — Low Upkeep — Factory Guarantee . . . National Distribution . . . Protected Territories . . . Easy Installation . . . Minimum Servicing.

THE *Radiant*
OIL FIRED WINTER AIR CONDITIONER



Precision Engineered for Economy in Price—Installation—Operation

SUPERIOR DESIGN — Tubular construction presents greater heating surface to flue gases than conventional furnaces . . . jacket is substantial and well finished . . . high temperature combustion chamber . . . motor driven blower unit and air filters.

FACTORY ASSEMBLED—Shipped complete with combustion chamber installed and jacket completely assembled.

Available in Four Models: Low Boy, Suspended Unit, Hi Boy, Counterflow

WRITE FOR COMPLETE RADIANT LITERATURE.
You'll sell— and profit more!

RADIANT UTILITIES CORP.
8817 18th Avenue, Brooklyn 14, N. Y.

RADIANT OIL BURNER

Furnace Duct and Fittings

FURNACE DUCT and fittings, including gravity, graduated trunk, and extended plenum systems, small pipe and perimeter systems, are described in a 24 page catalog — L. J. Mueller Furnace Co., Milwaukee. The catalog also illustrates and describes the company's complete line of registers and grilles. AA 106

Cutting Applications

PORTABLE POWER SAW applications are described in a 24 page manual which also gives information on blade selection—Skil Corp., Chicago. The manual lists 30 different materials and suggests effective methods for cutting. AA 107

Welding Accessories

CATALOG (16 pages) covers a complete line of welding accessories — A. O. Smith Corp., Milwaukee. It also describes a "package buying" method designed to simplify handling and make for speedier shipment. AA 108

Vent and Blow Pipe Connectors

A FOUR PAGE CIRCULAR describes and illustrates Jenkins Tite-Aire pipe connectors—Ralph Mfg. Co., Inc., Wadsworth, Ohio. The connectors, designed particularly for perimeter and 4 in. type heating and cooling systems, are also used in vent and blow pipe work and in numerous other applications. AA 109

Vane Runners for Turning Vanes

BROCHURE describes vane runners for use in duct construction in air conditioning, heating and ventilating systems—All-Tite Sheet Metal Co., Inc., Long Island City, N. Y. The vane runners were designed to simplify the fabricating and installing of turning vanes in square and change-of-shape elbows. Runners are made of 24 gage galvanized metal, are available in 8 ft lengths. AA 110

Air Conditioning Sales Aid

SELLING the residential air conditioning market through the builder, architect and home owner is the subject of a 26 page booklet—Servel, Inc., Evansville, Ind. The first section is devoted to the new home market, includes information on model home promotion and gives air conditioning data. *Selling the Home Owner* is the title of the second section, which deals with the existing home market. The use of a new credit tool—the open end mortgage — is suggested. AA 111

Blue Print Reading in Welding Applications

THE FOURTH EDITION of *Simpl, Blue Print Reading With Special Reference to Welding and Welding Symbols* contains new information, additional drawings and photographs — The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland. All symbols and other data have been revised to bring them up to the latest standards. The book is priced at $1.00, may be purchased direct from the company.

The finest Elbows on the market carry this

TRADE *F. Dieckmann* MARK

Established 1871

The line is complete and the prices are right. Dieckmann makes elbows for every angle and of every standard size, style and metal. Plain round, corrugated round and square styles A and B. Hot-dipped galvanized after formation.

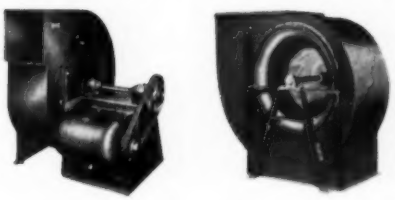
Your jobber carries Dieckmann elbows and shoes with the Dieckmann trademark to guarantee quality and service. *WRITE FOR COMPLETE CATALOG.*

THE FERDINAND DIECKMANN COMPANY

1300 HARRISON AVENUE **CINCINNATI 22, OHIO**

NO FINER LINE-UP FOR PLANT CLEAN-UP

ELECTRONIC AIR CLEANING—New Westinghouse PRECIPITRON® Oil Mist Control unit efficiently collects coolant mists generated during machining operations. Send for Catalog TC-1400.



INDUSTRIAL FANS—An efficient new General Purpose Fan, requiring smaller motors, is available on short delivery. Three wheel types for fumes, gases, metallic dusts, chips, shavings, or long stringy materials. Four arrangements for integral or separate motor drive, belt or direct-connected. Send for Catalog 1150.

For data on the full Westinghouse line, ask for General Catalog 600, or call your local Westinghouse-Sturtevant office.

CAST IRON VOLUME FANS—Sturdy fans designed for severe industrial exhausting applications or furnishing air blast. Noted for trouble-free low-cost service under toughest conditions. Send for Catalog 1130.

UTILITY SETS—Low-cost V-belt and direct driven models available from stock. Sturdy, quiet centrifugal fans, easy to install for air supply, ventilation and fume exhaust. Send for Catalog TC-1160.

YOU CAN BE SURE...IF IT'S **Westinghouse**

AIR HANDLING

Westinghouse Electric Corporation
Sturtevant Division
Hyde Park, Boston 36, Massachusetts

Please send me a free copy of General Catalog 600.

Name _____

Company _____

Title _____

Address _____

City _____ **Zone** _____ **State** _____

cut chimney costs avoid job delays with

VAN-PACKER

PACKAGED MASONRY

CHIMNEY

EASY TO INSTALL IN 3 HOURS OR LESS

FIRE-SAFE . . . INSULATED

INSTALL the chimney and the heating plant. It takes only 3 hours or less to install Van-Packer. No service required. Makes central location of heating plant possible—shorter heat runs—greater fuel savings.

Cut holes! Nail support in place

Set each section

Nail flashing and install housing

Underwriters' listed for all fuels. F. H. A. and code accepted. No delays on the job. Immediate delivery. Everything furnished. Nothing else to buy. Send the coupon.

VAN-PACKER CORPORATION

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Please send me your latest complete circular on Van-Packer Packaged Masonry Chimney.

Name _____

Address _____

City _____

State _____

Name of Firm _____

Also Manufactured and Distributed in Canada by C. A. McRobert and Son, Ltd., St. Laurent, Quebec.

we hear that . . .

MINNEAPOLIS-HONEYWELL Regulator Co. has started construction of a new factory at Gardena, Calif., to be operated by the firm's appliance controls division. It will enable the firm to expand production of automatic controls for floor furnaces, wall heaters and central heating plants. It is expected that 2000 persons will be employed at the new factory.

MEMBERS of the Georgia Board of Examiners of Warm Air Heating Contractors were recently sworn in for a new four year term by Governor Herman Talmadge. The board was created in February 1949, after a law was enacted providing for the licensing of warm air heating contractors operating in several of the larger counties. The law states that no individual or company can engage in the warm air heating business unless he or one of his responsible employees has passed a state examination and has been properly licensed by the state.

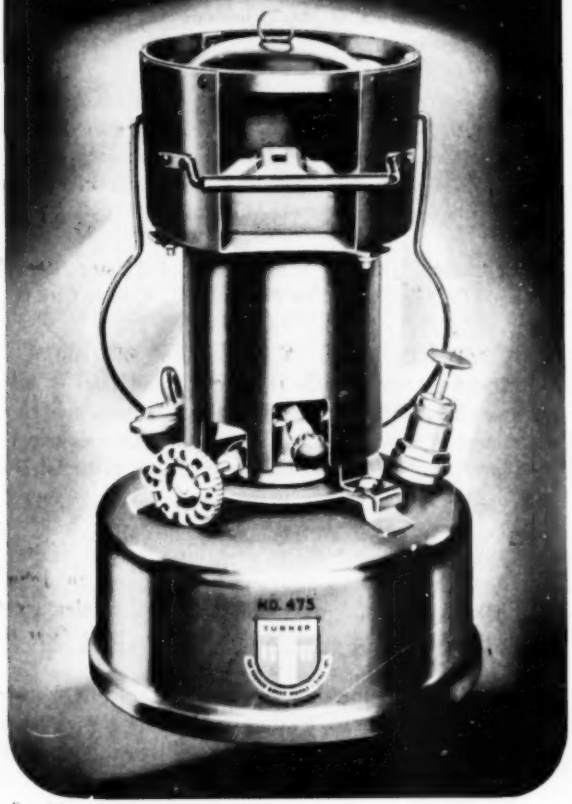
MEN FROM THE HEATING INDUSTRY being sworn in to serve on the Georgia Board of Warm Air Heating Contractors by Governor Herman Talmadge are *(l. to r.)* John G. Mauldin, E. M. Copeland, Jr., W. H. Raymond, Jr., W. L. Mingledorff, Jr., and Laurence F. Kent

CHRYSLER AIRTEMP DIV., Chrysler Corp., is directing its consumer advertising to housewives through a series of ads appearing in such national magazines as *American Home, House Beautiful, National Geographic,* and *Saturday Evening Post.* "The housewife is the key to the residential air conditioning market," according to J. F. Knoff, vice president and general sales manager. "By showing her that air conditioning will lessen her housework and keep her family healthier and more comfortable", he said, "we will have opened up a 20-million home market, now less than 1 per cent saturated."

NORMAN PRODUCTS CO. has purchased all production machinery and tools of the Security Mfg. Co., Kansas City, Mo. All tools, dies, patterns, designs, and one trade-name were involved in the purchase. Norman Products will manufacture and sell the line of furnaces

TURNER

Quality Since 1871



No. 475 Low Pressure
TINNER'S FIRE POT

● Smokeless . . . sparkless . . . sootless! Complete with Turner's exclusive "Carburetor Control" for more perfect combustion; also a flame control — for exact heat desired — which automatically cleans the orifice. Construction assembly permits quick, easy accessibility . . . windshield, top-plate, and bail handle are one unit, and can be lifted from tank by loosening one wing nut. Burner coil is made of extra-heavy seamless steel tubing, protected by sturdy outer jacket that maintains heat without overheating; can be generated and used in heavy wind. Fuel capacity — one gallon; burns for 9 hours on one filling. Get details, too, on Turner's popular Plumber's Fire Pot (No. 275); also Turner's complete line of Blow Torches.

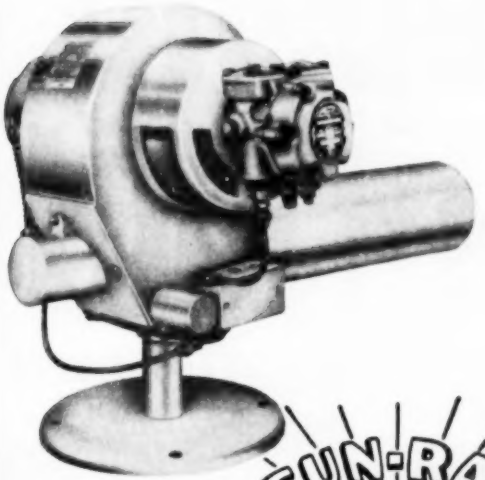
See Your Jobber

THE TURNER BRASS WORKS

SYCAMORE ILLINOIS

Since 1871

Steal Money from the Chimney



SUN-RAY
SERIES S
OIL BURNERS

Cut heating cost up to 36%

Fuel dollars that ordinarily go up the chimney are kept in the owner's pocketbook when a Sun-Ray Series "S" Oil Burner is on the job. That's why more Sun-Ray burners are being installed than ever before. Want proof? Then...

Check These Sun-Ray Features

1. Sun-Ray Aerodynamic Housing.
2. Sun-Ray Combustion Head.
3. Delayed Action Oil Brake.
4. Precision Construction.
5. Burns Catalytic or Distillate Oils.
6. Ideal for Conversions or New Furnaces.

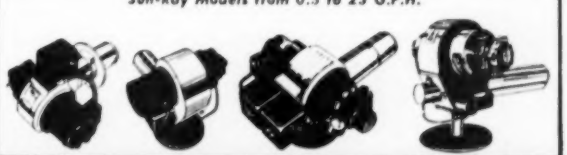
Against These Performance Results

1. Highest CO_2.
2. Lower stack temperature.
3. Less draft required.
4. 500° to 600° higher flame temperature.
5. Cleaner combustion – always.
6. Most economical heating.

And You'll Want to Sell Sun-Ray

Outstanding leader in quality, popularity and profit potentials. Write today for complete information.

Sun-Ray Models from 0.5 to 25 G.P.H.



SUN-RAY BURNER MFG. CORP.

139-34 Queens Boulevard Jamaica 2, N.Y.

HEATING DEALERS

depend on field

FOR TROUBLE-FREE PERFORMANCE

1—MADE OF HEAVY MATERIALS — Field Controls Last Longer.

2—BALANCED AT FACTORY — Eliminating weight variations which could affect control's accuracy.

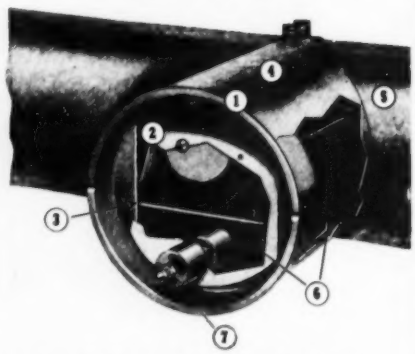
3 — ROCKER TYPE HINGE PIN — Quickly responsive, no friction. No sticking.

4—LONG COLLAR — No warping or clogging due to heat or soot, no service calls.

5—FREE SMOKE PASSAGE — A Field Control never blocks the flue.

6—SIDE WINGS AND FITTED GATE — More accurate because opening in control increases more uniformly.

7—FACTORY ADJUSTED — Set to maintain .06" draft until instrument setting is made.



The Field Draft Control is quick, easy and simple to install. But far more important it keeps performing without requiring attention itself — no warping, sticking, clogging — and without causing extra service calls due to smoking or fuel waste. And for the customer a Field Control means maximum fuel economy. For every 1/100" of excess draft eliminated, due to Field's greater accuracy, there is up to a 1% fuel savings. Yes, you can depend on Field.

FIELD CONTROL DIVISION

of H. D. Conkey & Company — Mendota, Illinois

AFFILIATES: Conco Building Products, Inc. — Brick, Tile, Stone
Conco Materials Handling Division — Cranes, Hoists

Field Controls are factory set to maintain an .06" draft until a precise, hair-line setting — possible with a Field — can be conveniently made.

we hear that . . .

purchased from Security and will also manufacture these units under the "Security" trade-name for the Rasch Mfg. Co., Kansas City.

AMONG THE IMPROVEMENTS planned by the Aluminum Co. of America is the expansion of the sheet rolling facilities at the Edgewater, N.J., works.

THE CONTROLS MFG. DIV., The Perfex Corp., recently moved from the main plant at Milwaukee to Iron Mountain, Mich. The division's sales, advertising, accounting and engineering departments will remain in Milwaukee with the corporation's executive offices.

EXCELSIOR HEATING SUPPLY DIV., Excelsior Steel Furnace Co., has moved to 2 E. 3rd St., Kansas City 6, Mo.

A NEW FIRM, the H. A. Pietsch Co., 894 Heckler Dr., Pittsburgh, will handle engineering and sales of heating and air conditioning equipment in western Pennsylvania, eastern Ohio and West Virginia. The company now represents U. S. Air Conditioning Corp., National Heater Co., and other manufacturers.

CARRIER CORP. has cut by one-third the size of its year 'round home air conditioner. According to John M. Bickel, vice president in charge of dealer sales, production of the air conditioners will be at least four times last year's.

Air conditioning dealers in Atlanta recently completed a three-day training session on new Carrier equipment, which included a trip to an air conditioned housing project to observe a unit in actual operation. Represented at the dealers' school were Atlanta Air Conditioning and Heating Co., Wellborn Heating Co., and Delta Heating Co.

PERFECTION STOVE CO. recently held a series of meetings with its furnace division's key distributors. J. H. Rasmussen, vice president and director of sales, spoke on developments in the design and production of warm air furnaces. A. D. MacLaren, sales manager of the furnace division, explained the company's plans for promoting heating equipment and year 'round units.

INCINERATOR PRODUCTS CO. has a new trade name — Chore Boy — for its domestic units. The former name, Waste King, has been sold to the Given Mfg. Co.

REPRESENTATIVES of heating wholesalers throughout the country attended the fourth annual jobber meeting of Armstrong Furnace Co., held in Chicago. A discussion of new jobber policies was presented by W. J. Olsen, president. H. G. Hays, Columbus district manager, introduced the company's new line of summer air conditioning equipment, outlining general application, design and sales features.

Don't take ANY brand of SOLDER

Here are the reasons WHY!

There is a theory that a man who specializes in mousetraps will build better mousetraps than the one who makes merely wood or metal products. This is the narrow view of the self-conscious specialist.

Others say, "Specialists are those who know more and more about less and less," which invites the conclusion that the greatest specialist of all must be he who knows everything about nothing.

Federated believes that the hundreds of products of non-ferrous origin have a basic family resemblance, and that the more we know about all, the more we know about each. Thus lead is found with silver and antimony, and copper and tin are found with iron. These various elements and others must be separated and refined, or in some cases, discarded. Then, re-combined in different ways, sometimes alone, sometimes with other non-ferrous ingredients, they make brass, bronze and aluminum ingot; solders and type metals; die casting alloys, lead products and bearing metals; anodes for plating and for cathodic protection.

Federated's competent organization of scientists and technicians, its widespread field force of servicemen, and its network of qualified distributors are unified under the central policy of producing quality products and making these products most useful to every customer from the smallest to the largest.

We count it an advantage to you, and to the jobber from whom you buy, that Federated's organization is big enough to specialize in quality control and service from the depths of the mine to the user's shop. It is one of the reasons that Federated is known as "Headquarters for Non-ferrous Metals."

Federated Metals Division

AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.
In Canada: Federated Metals Canada, Ltd., Toronto, Montreal

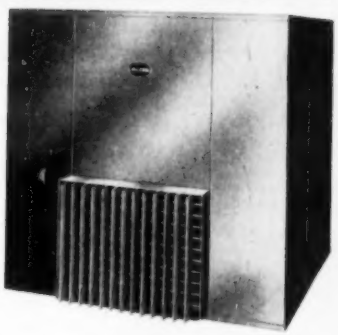
Federated first in the non-ferrous field

Aluminum and Magnesium • Babbitts • Brasses and Bronzes • Anodes
Die Casting Metals • Lead and Lead Products • Solders • Type Metals

There's Big profits

selling RETAIL STORES

The "RETAIL-preferred"
ALTON
Evaporative Cooler!



Yes, YOU can offer the ALTON-preferred by merchants the nation over for comfort cooling.

. . . . because, we're offering *you* the Alton — the evaporative cooler chosen by over 100 J. C. Penney stores; by retail stores, big and little, independent and chain, all across America! Yes, Alton quality and Alton low price (with a good margin for you) make selling retail stores easy!

These customers too!

Factories	Taverns	Super Markets
Churches	Night Clubs	Bakeries
Theatres	Halls	Beauty Shops
Cafes	Bowling Alleys	Morticians

Here's why they all want the ALTON!

It's economical! The Alton cools by evaporation, not by expensive refrigeration! So the Alton is low in first cost, inexpensive to operate and maintain. And service expense and "call-back" costs are nil! The buyer can afford the Alton!

It's complete! Comes "packaged" — ready to install! No parts missing and no elaborate assembly.

It's quality! **Heavy squirrel-cage blower** moves air quietly, effectively. **Complete Cabinet:** All parts enclosed in galvanized **steel! Turbospray:** the permanently lubricated and water tight pump-spray that 'mists' the water over the whole mat surface — "thoroughly wets". **Two sets of mats:** keeps water contained in airwasher section, out of blower section!

Learn why YOU want ALTON! All details and prices if you mail us this coupon!

ALTON MFG. CO., 1112 Ross, Dallas, Texas
Please send me full information about the Alton Evaporative Cooler. No obligation.

Name .....
Firm Name .....
Address .....
City ..... State .....

"I SELL JANITROL BECAUSE"...

"I find it most profitable to handle Janitrol exclusively"
A. H. GERDSEN, GERDSEN HEATING CO., CINCINNATI
Janitrol
AUTOMATIC HEATING

Concentrating on one *complete* line of heating equipment has *many* advantages that result in *bigger* volume, *bigger* profits, and greater stability.

By putting all your efforts behind the nationally-known Janitrol line, you *simplify* your servicing of equipment, employee training, your sales effort, display problems, advertising, and stocking inventories.

Above all, your salesmen and customers alike are sold on the conviction that you are selling the best and will stick to it!

Instead of being just another "any equipment" broker, your concentrated effort plus greater Janitrol cooperation help to establish you as a leading heating authority in your community. Like Mr. Gerdsen, many other dealers have found that selling Janitrol exclusively is the direct way to *success*. So, you owe it to yourself to get all the facts about the Janitrol franchise.

WRITE TODAY *and we will arrange for a representative to call on you.*

SURFACE COMBUSTION CORPORATION
Toledo 1, Ohio

® Janitrol
Automatic Heating

we hear that . . .

THE EXPANSION program now in process at the Parkersburg, W. Va., plant of the Fiber Glass Div., Libbey-Owens-Ford Glass Co., includes the installation of 48 additional units for making textile fiber glass. About 175 new employees will be hired.

THE SCOTT-NEWCOMB CO. has been purchased by the Barber Gas Burner Co. Equipment, inventory, and all physical assets of Scott-Newcomb are being moved to Cleveland.

DRAVO CORP. has received a National Safety Council award for employee safety. The award was presented to Carl B. Jansen, company president, by J. E. Goble, president, Western Pennsylvania Safety Council, Inc.

THE TORRINGTON MFG. CO. plans the construction of a new air impeller manufacturing plant in Oakville, Ont.

THE SHEET METAL MFG. CO., located in Youngstown, Ohio, has joined the Gas Appliance Manufacturers Association. The company plans to make cast iron gas furnaces.

APPROXIMATELY 1300 dealers attended the series of regional meetings held this spring by U. S. Machine Div., Stewart-Warner Corp. New products shown included wall and conventional furnaces for oil or gas consumption. Subjects treated were how to set up a profitable sales plan, how to make the showroom sell, how to train salesmen, how to find prospects, and how to control sales profits.

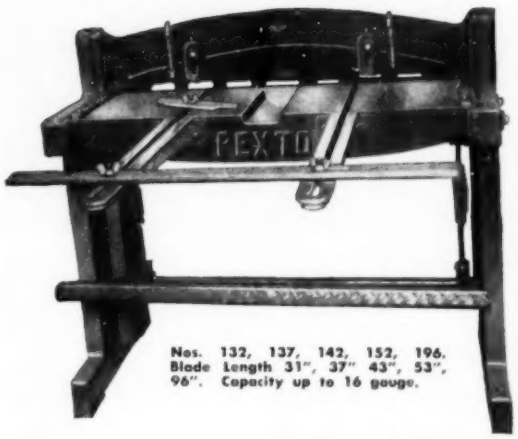
ROBERTSON HEATING SUPPLY CO. has started construction of its new warehouse at West Main St. & Rockhill, Alliance, Ohio.

MAX TAPPERO, Boston district manager, Janitrol Domestic-Commercial Heating Div., Surface Combustion Corp., has been elected a director of the Industrial Div., New England Gas Association.

W. B. CONNOR ENGINEERING CORP. has shortened its corporate name to Connor Engineering Corp.

OVER $7000 in U.S. defense bonds and stamps has been awarded to dealers and their salesmen in Williams Oil-O-Matic's "E's for Effort" campaign. Among the awards were a $100 bond for the best window or showroom display built around the company's atomization demonstrator, received by Francis X. Bolls, Bolls Furnace Co., Indianapolis, and a $100 bond for the most points at the three-quarter mark in the campaign, which was won by Norman F. Plouff, Fay and Scott, Dexter, Me.

PEXTO...Best Buy
in
SQUARING SHEARS



Nos. 132, 137, 142, 152, 196.
Blade Length 31", 37" 43", 53", 96". Capacity up to 16 gauge.

Designed* for easy accurate cutting.

Available in sizes from 30" to 96".

Furnished complete with Front Gauge, Bevel Gauge, Graduated adjustable side Gauge and the famous PEXTO Rack and Pinion graduated precision Back Gauge.

* Design Pat. DES 157,611.

THE PECK, STOW & WILCOX CO. — since 1785 — **Southington, Connecticut, U.S.A.**

SPX52R

. . . it had to happen!

**NEW BUILDING,
NEW COMPANY NAME
HONORS THE INDUSTRY'S LEADING
GAS PRESSURE REGULATORS—**

Thanks to you, our customers, we've grown out of our britches!! We've just completed a "2-pants" plant to handle your ever-growing needs for MAXITROL Gas Pressure Regulators.

In occupying the new plant we also adopted a new name — MAXITROL COMPANY — honoring the "star" of our show.

Our new and greater production, engineering and research facilities, and our increased personnel will set an even greater goal for MAXITROL achievements.

MAXITROL
COMPANY
formerly
DETROIT REGULATOR CO.
Tomorrow, as yesterday, you may look to MAXITROL for engineering and imaginative leadership!

12200 BEECH ROAD • DETROIT 28, MICHIGAN

*Sold on the Pacific Coast by: PACIFIC SCIENTIFIC CO.
San Francisco, Los Angeles, Seattle, Portland*

More and more, for the best in Asbestos — both in respect to quality and service, leading furnace and air-conditioning installers insist upon Sal-Mo
SALL MOUNTAIN COMPANY
Mill and Office at HAMILTON, OHIO
Sal-Mo
ASBESTOS PRODUCTS
ASBESTOS CEMENT
ASBESTOS AIRCELL SHEETS AND BLOCKS
ASBESTOS MILLBOARD
ASBESTOS FURNACE CEMENT
ASBESTOS PAPER
ASBESTOS CORRUGATED AIRCELL PAPER
ASBESTOS PIPE JOINT TAPE

we hear that . . .

TWO TRAINING SCHOOLS on basic principles of service and application engineering for Servel, Inc., air conditioning distributor personnel have been held at the company's factory in Evansville, Ind.

THE SERVEL AIR CONDITIONING service school at Evansville was attended by distributor personnel from all parts of the country

JAMES F. DAUT has retired after 40 years of service with the Wheeling Corrugating Co. branch at Richmond, Va. For the past 28 years, Mr. Daut has been manager of the branch.

THE LENNOX FURNACE CO. plans the erection of a new factory at Etibicoke, near Toronto, Canada.

CHESTER C. YOUNG and H. George Gregerson have formed a consulting engineering firm with offices at 2921 Fairmount, Dallas.

WARREN-CONNOLLY CO., INC., New York, recently displayed the Worthington line of package residential and commercial air conditioners to approximately 350 air conditioning contractors. Phil Shaw, Worthington product manager at the Holyoke, Mass., plant, explained the technical phases of the line.

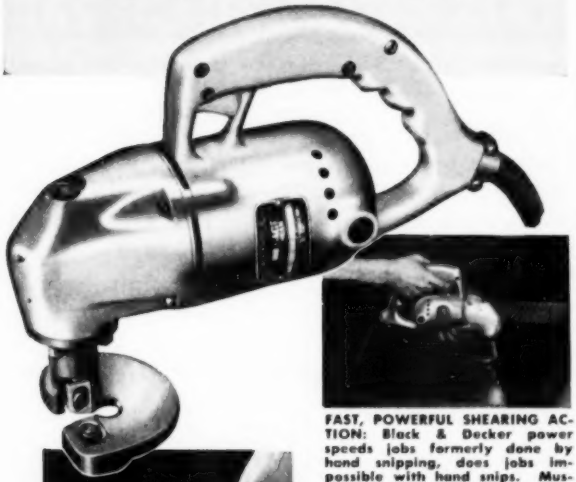
THE MAJESTIC CO., INC., recommends to its dealers that long baseboard registers be used in connection with its perimeter heating systems. According to the company, this type of register distributes an extended blanket of warm air which counteracts the cold infiltration around windows and outside walls.

GENERAL CONTROLS CO. is establishing a new department for analysis of customer requirements in the design and development of new products. The department will supplement the work of the regular engineering divisions. It will be headed by H. A. McIntosh who, since 1936, has been associated with various manufacturers as an engineer on automatic controls and accessories.

A NUMBER OF BRANCH OFFICES of Wheelco Instruments Div., Barber-Colman Co., have new addresses. The Baltimore office is now at 338 E. 25th St.; Boston area office,

Throw away your snips!

Switch to Black & Decker Electric PORTO-SHEARS for faster, easier, more accurate cutting!*



FAST, POWERFUL SHEARING ACTION: Black & Decker power speeds jobs formerly done by hand snipping, does jobs impossible with hand snips. Muscular strain is a thing of the past!

CUTTING OPERATION ALWAYS VISIBLE: Follow straight lines, irregular patterns and curves down to small radius easily with Porto Shears. Visible operation keeps rejects to a minimum.

CUTS MANY MATERIALS: steel, galvanized iron, Monel, stainless, copper, aluminum, lead, and other non-ferrous metals. Adaptable to thin sheets of laminated wood or sheet plastics.

Once you've used a B&D Electric Porto-Shear, you'll never want to go back to slow, tedious hand snips. B&D Porto-Shears cut sheet metal too tough for snips! They speed up jobs where snips are slow . . . save time and cut costs on hundreds of jobs. . . eliminate muscular strain. Like all B&D tools, Porto-Shears are made with husky housings, top-quality parts. Two models, in capacities for 16-gage and 12-gage steel. See your nearby Black & Decker Distributor for demonstrations of these and other famous B&D Tools. Write for free catalog to: THE BLACK & DECKER MFG. CO., 641 Pennsylvania Ave., Towson 4, Md.

*Trade Mark Reg. U. S. Pat Off.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

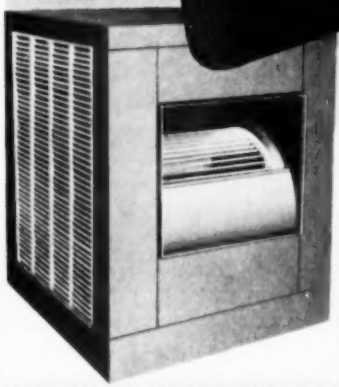
PORTABLE ELECTRIC TOOLS

DRILLS SANDERS BENCH GRINDERS HAMMERS

Higher Cooling Efficiency At Lower Cost With . . .

CHILL-AIR

EVAPORATIVE COOLERS



Lower installation and operating expense, easier servicing and maintenance, plus top cooling and air movement efficiency, are the reasons why Chill-Air Evaporative Coolers have been so popular with contractors and building owners over the past 20 years.

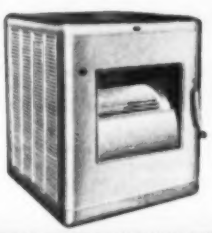
Chill-Air Commercial and Industrial Coolers are designed for easy installation on the roof or side of building. Standard models are available for reducing temperatures 12-18° in spaces ranging from 2,500 to 30,000 cubic feet. Larger sizes built to order.

The Chill-Air patented odorless and sag-proof evaporative pads are easily removable for cleaning. The 110-220 v. motor can be oiled and serviced by simply removing pads. Uniform, non-clog water distribution troughs assure maximum evaporative surface — and the simple, trouble-free recirculating pump system eliminates water waste.

INDUSTRIAL COOLERS

Model No.	CFM	HP	Cu. Ft. of Space to be Cooled
80P	7800	¾	5,000 to 11,000
100P	9600	1	7,000 to 15,000
125P	12500	1½	9,000 to 20,000
150P	15000	2	15,000 to 30,000

Above Motors 110, 220 Volt Single Phase (Three-phase motors available on order)



COMMERCIAL COOLERS

Model No.	CFM	HP	Cu. Ft. of Space to be Cooled
33	3300	⅓	2,500 to 3,000
40	4000	⅓	2,500 to 3,500
45P	4500	½	3,000 to 4,000
60P	5800	½	3,500 to 5,000
70P	6800	¾	3,500 to 6,000

⅓ and ½ H.P. Motor 110 Volt Single Phase
¾ H.P. Motor 110-220 Volt Single Phase

Free Engineering Service

Write for Free Descriptive Literature

National Engineering & Mfg. Co.
519 Wyandotte
Kansas City, Mo.

we hear that . . .

at 435 Newtonville Ave., Newtonville; Chicago office, at 2561 N. Clark St.; Houston office, at 1951 Richmond Ave.; Montreal office at 6693 Park Ave., Montreal; New York area office, at 66 Hudson St., Hoboken, N. J.; Philadelphia office, at 1433 W. Erie Ave.; Rock Island, Ill., office, at 3711 14th Ave.; Rockford, Ill., office, at 1300 Rock St.; and Springfield, Ill., office at 1011 Ridgely Bldg.

A NATION-WIDE SURVEY to determine the fluctuation in home electric power consumption over a 24 hour period has been proposed by the General Electric Co., with the cost to be shared by General Electric and the electric utilities. Clarence H. Linder, vice president and general manager, Major Appliance Div., Louisville, said such data "is necessary for an effective load planning effort" by the utilities. He gave no estimate of the possible cost, but said the company has engaged the services of an engineering firm to make a study to determine just what information, techniques, equipment, time, and expenditures will be required for the survey.

The company's air conditioning division recently reported its best first quarter on record. F. J. Van Popplelen, general manager of the division, said that the company is selling home cooling equipment at several times its planned rate and has had to revise its original production schedules upward. Biggest gain, he said, has been in packaged units for air conditioning.

CONSTRUCTION HAS BEGUN on a new and larger steel service plant for the Milwaukee operations of Joseph T. Ryerson & Son, Inc. The new building, located at S. 84th St. and the Milwaukee railroad, will replace the present plant on S. 19th St. It will consist of two large building units and an office building, and will have approximately 166,000 sq ft of floor space — about three times the capacity of the present plant. W. F. Kurfess is Milwaukee plant manager.

THE AMERICAN Hot Dip Galvanizers Association has elected Bonnie E. Trent, of Armco Steel Corp., as its president for 1953-54. He was chosen at the annual meeting held recently in Cincinnati.

IN ORDER to take care of increased demand, Universal Diffuser Corp. has acquired 10,000 sq ft of additional manufacturing facilities. The new plant and executive offices are at 1360 Garrison Ave., New York 59. The move was completed last month.

FARR CO. has expanded the territory served by its New Jersey representative, A-C Products Co., Paterson, to include the metropolitan New York area. Offices are being opened in New York to facilitate operation of the enlarged territory.

It's the *LOW DOWN* DIRT trapped by WILSON'S HAIR FILTERS that GUARANTEES LONGER LIFE

In Wilson *Hair* Filters the entire dust-holding capacity is completely utilized. This means, *no surface dust stopping only*, but Full-Depth Dust Trapping at its best . . . and many extra months of filter life.

The *reasons* are so simple:

1. The hair media in Wilson *Hair* Filters act in the same manner as Mother Nature's proven way of filtering the air you breathe. It's the *hair* that cleans the air . . . more easily, more effectively, more economically.
2. The multi-directional distribution of the hair in Wilson *Hair* Filters literally invites all dust and dirt to come in and be trapped throughout the entire filter interior.
3. Most brands of air filters require oiling on their inlet surfaces. This stops dust prematurely, loads up the incoming air side and materially shortens filter life.

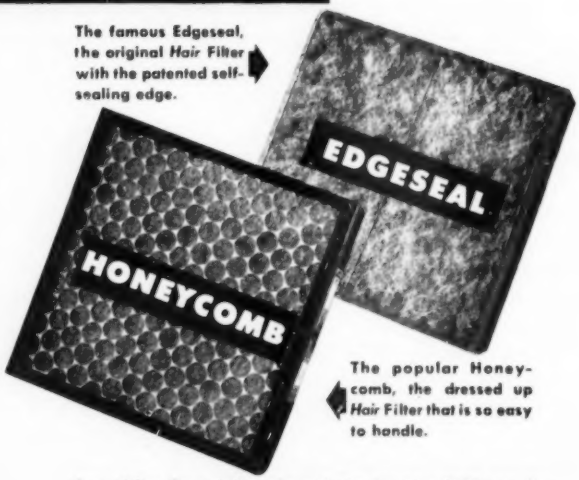
Wilson Hair Filters are not oiled on the inlet side. Instead, they receive an even distribution of mineral oil *on their outlet surface*, which:

(a) augments the already amazing ability of the hair itself, to catch and hold dust, and—

(b) builds an impregnable barrier which halts dust and dirt after reaching the furthermost practicable penetration point.

WILSON & CO., INC.
(Air Filter Division) 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.



The famous Edgeseal, the original *Hair* Filter with the patented self-sealing edge.

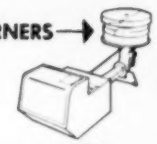
The popular Honeycomb, the dressed up *Hair* Filter that is so easy to handle.

Save delay. Save dollars. Save doubt. Send for FREE sample with details and prices.

6 GREAT LINES... 6 GREAT LEADERS!

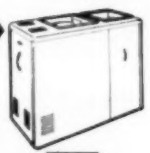
ROBERTS-GORDON
Spreader Flame
GAS HEATING EQUIPMENT

GAS CONVERSION and DUAL FUEL BURNERS
45,000 to 950,000 BTU Input



HIGHBOY FURNACE
85,000 BTU Input

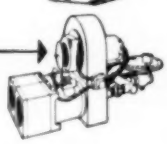
WINTER AIR CONDITIONERS
81,250 to 155,000 BTU Input



THE GORDONEER BOILERS
78,000 to 150,000 BTU Input

UNIT HEATERS
70,000 to 230,000 BTU Input

NORDENSSON INDUSTRIAL BURNERS
1,000,000 to 6,500,000 BTU Input



A.G.A. Approved • ASME Code Requirements • SUR Requirements

Our nation-wide representatives organization is at your service . . . Write us for DESCRIPTIVE LITERATURE and the name of our representative for your territory — he'll show you how ROBERTS-GORDON products and promotion can mean MORE PROFITS to you!

SEE ROBERTS-GORDON BEFORE YOU SELL!

GORDON ENGAND Spreader-Flame

Manufacturers of Gas Heating Equipment for Over a Quarter of a Century.

DEPT. AA BUFFALO 6, N. Y.

RANDALL BEARINGS

Randall bearings last longer—run quieter because they are specially engineered and precision made for specific applications. Randall's are made from the very finest of materials and employ an exclusive double lubricating feature that assures longer lasting, trouble-free service. Randall bearings, proven dependable by millions of applications, have been accepted as standard equipment by approximately 85% of the leading manufacturers in the air moving industry. Randall bearings are available in a variety of sizes and styles for shaft sizes ranging from ½" to 3-15/16". Write today for additional information on Randall bearings or send your requirements. Randall's engineering department is at your service.

BRONZE BAR STOCK
BRONZE BUSHINGS
PILLOW BLOCKS
SHEET LUBRICATOR

Randall

GRAPHITED BEARINGS
THRUST WASHERS
SAFETY COLLARS
BRONZE CASTING

RANDALL GRAPHITE BEARINGS, INC.
1000 S. GREENLAWN AVE., LIMA, OHIO

Make Single or Double Blade

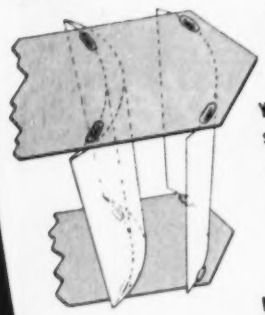
AIR TURNING VANES

for

Square Elbows

with the New Engineer Approved

"DURO-VANE-RAIL"



ONE hammer blow secures Blade with positive lock, rattle free

YOU make Blades of scrap. Cut square, no notching.

"DURO-VANE-RAIL" supplied in 8 foot lengths.

WRITE TODAY

For folder on how to make Engineer Approved Air Turning Vanes using "DURO-VANE-RAIL"

Save Money
Save Time

DEPT. 1B

DURO-DYNE
CORPORATION
38 South Franklin Street,
Hempstead, L. I., N. Y.

Save money on Multi-blade DAMPERS

Make your Dampers with

"DURO BLADE KIT"

PRECISION-ENGINEERED

DAMPER HARDWARE

Note Parallel
OR Opposed blade action

- Each blade quickly adjustable
- Tilting brackets line up automatically After Installation (can use inexperienced labor)

Write for Samples & Prices DEPT. B

appointments . . .

JACK SEARLS as manager, product sales, for Morrison Steel Products, Inc. Formerly vice president in charge of sales for the White-Rodgers Electric Co., he assumes charge of three of the company's divisions in stepping into this newly created post.

Jack Searls

T. L. Conlon

THOMAS L. CONLON, Royal Oak, Mich., as representative in the Detroit area for Jackson and Church Co. He will handle the firm's complete line of furnaces.

CHARLES L. WHITE as eastern sales engineer for Tuthill Pump Co., with offices at 82 Hathaway Ave., Elmont, L. I., N.Y.

C. L. White

C. J. Davis

CHARLES J. DAVIS as assistant sales manager of Skuttle Mfg. Co. Previously Mr. Davis was sales representative for Clayton and Lambert Mfg. Co.

TWELVE NEW sales agents as representatives for Universal Diffuser Corp: Airite Engineering Co., for Rhode Island; A. B. Banowsky, for Houston; Barton Refrigerating Co., Indiana; J. L. Brown, Arkansas; Richard A. Farr, Columbus; Irvington Co., Buffalo; Duncan G. MacLean Co., Yakima, Wash.; Miller-Spann & Co., North and South Carolina; Pacific Air Control, Oregon; Henry S. Parks Co., Utah; Thermalair Engineering Co., Michigan; and H. V. Witherspoon, Baltimore and Washington, D.C.

T. E. CARSON as assistant sales manager in charge of sales east of the Indiana and Ohio state lines for Fluid Heat Div., Anchor Post Products, Inc. R. T. Demarest is assistant sales manager covering operations west of

AIR YOUR VENTILATION PROBLEMS WITH PENN DYNAFANS

No doubt about it—Penn Dynafans increase employee efficiency in your customer's plants by exhausting the "hot spots." This rugged unit can be depended upon to handle the toughest ventilation problems . . .

- Motors out of the air stream, safely remove dust, heat, fumes, vapors, etc.
- Economical to install and operate.
- Sizes range from 250 c.f.m. to 30,000 c.f.m.
- Pulling power is positive and units will not overload regardless of resistance.
- Units are quiet running and have a low clean silhouette.

Write for complete literature today.
Representatives and Distributors in Principal Cities.

PENN VENTILATOR CO.
PHILADELPHIA 40, PENNSYLVANIA

FOR MORE THAN 25 YEARS THE BUILDERS' ROOF TOP LINE!

Get the BEST* in Warm Air Baseboard Heating!

GET BRANDES!

Brandes Wall Base heating is easy to install. Its superior design permits spreading of heat evenly into entire room area. It's economical. It's the "News of the year"! Get in on this fast moving profit maker for '53. Write for details today!

★ BIGGER PROFIT
★ EASY INSTALLATION
★ LOW COST

*The First, and Patented

BRANDES COMPANY
2046 Winnebago
MADISON 4, WISCONSIN

appointments . . .

the Indiana and Ohio state lines. Mr. Carson will maintain headquarters in Baltimore; Mr. Demarest, in Red Oak, Ia.

T. E. Carson

R. T. Demarest

BYRON M. CLARK as a member of the sales staff of Benjamin Wolff and Co., representing the Tin Mills Products and Metal Decorating Div. Previously, he was with Ball Brothers Co. and Wilson & Bennett Mfg. Co.

P. E. CARTER as regional manager for Toridheet Div., Cleveland Steel Products Corp., to supervise sales in an area including western Pennsylvania, Ohio, Kentucky, and southern Indiana. Formerly, he acted in a similar capacity for Typhoon Air Conditioning Co.

PAT M. CROWLEY as Chicago area sales director for The Excelsior Steel Furnace Co. He will be in charge of all city and suburban salesmen.

DWIGHT H. RUH as general sales manager for Sall Mountain Co., manufacturer of asbestos fireproofing and insulating products. Mr. Ruh started with the company 25 years ago, and has, most recently, been in charge of sales in the Detroit area. In his new post, he will supervise sales from the main office in Hamilton, Ohio. Mr. Ruh succeeds Frank R. Anderson, who retired recently after over 40 years of service with the company.

D. H. Ruh

Max Norton

MAX NORTON as manager of dealer-sales relations for the Williams Div., Eureka Williams Corp. He will coordinate dealer relations and home office sales departments.

THIS AMAZING NEW BETT-MARR
outperforms sheet metal saws costing six times as much

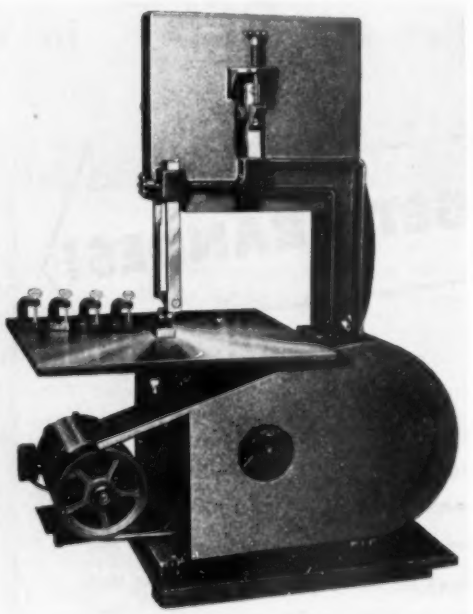
For faster, smoother, more accurate cutting of galvanized sheet metal, there's nothing better than a Bett-Marr—yet, it actually costs so little, no shop can afford to be without one.

The all-cast frame of the new, improved Model 14 MS assures the utmost in stability and accuracy and reduces vibration to a minimum.

CUTS 50 to 70 STACKED SHEETS—of galvanized sheet metal up to 15 inches per minute. An all purpose 14 inch bandsaw with lifetime sealed precision bearings.

SMOOTH, POWERFUL CHAIN DRIVE—Blade speeds from 125 to 2200 FPM quickly adjustable for metals, plastics, wood, castings or forgings.

POSITIVE BLADE CONTROL—Case hardened guides with carbon back-up bearing (adjustable up to ½" blade width) assure accuracy. Flanged wheels control blade for perfect radius and straight line cuts.



BETT-MARR MFG. CO. HOPKINS, MINNESOTA

☐ Please send me more information on the Bett-Marr sheet metal saw

☐ Where can I buy a Bett-Marr

Name .....

Address .....

City ..... Zone ..... State .....

Shown above MODEL 14 MS*

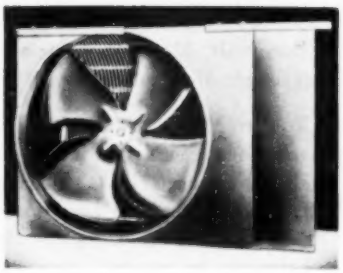
Depth of Cut 8¼
Blade to Frame 13½
Table Size 20x22
Overall Depth 34"
Blade Length 97"

*Includes set of 4 sheet metal clamps and riser bar insert to match for sheet metal work.

MAIL COUPON TODAY . . . GET THE AMAZING FACTS

Learn how you can cut production costs with a Bett-Marr sheet metal saw. It pays for itself quickly in both large and small shops. (Equipment dealers—write for information on available territories.)

This BIG Brand New Fan Fits Your '53 Plan



The REX AIRATE "AIRGALE"

● Here's the "AIRGALE", a new number in the famous REX AIRATE line, tailor-made for your hard-to-please customers. It's a belt-driven reversible 20 inch ventilating fan—with two speeds for intake and two for exhaust—controlled by a single switch.

The REX AIRATE "AIRGALE" is a quiet, powerful source of cool comfort for one and two family homes, motels, offices, stores, 4-to-6-room apartments and display rooms. The "AIRGALE" is so big and beautiful—so obviously distinctive and dependable—that it sells on sight.

Here Are The Show 'Em and Sell 'Em Features

MOTOR • ¼ H.P., 2-speed, split-phase, 60 cycle, 115 volt, A.C., single phase operation. Rubber mounted to absorb vibration. No radio or television interference.

SWITCH • The "Controlair" combination forward and reversing switch, provides two-speed discharge or intake operation. Complete with nine foot plug-in cord.

HOUSING AND GRILLE • Heavy gauge, reinforced steel cabinet with rubber mounts. Decorative grille acts as a finger safe, curtain safe rear guard.

CONSTRUCTION • "H" frame with bearing assembly riveted securely to side and bottom of fan housing. Extra strong and rigid, insures quiet operation.

BLADES • Four deep pitched blades. Insure quiet and more powerful performance.

EXPANDER • Permits installation in a 32-inch wide opening.

FINISH • Grille is gleaming white baked enamel. Cabinet is cool, light green Hammerloid baked enamel.

CERTIFIED RATING • NAFM air delivery is in accordance with the standard test code for centrifugal and axial fans, and conforms with U. S. Department of Commerce Standard No. 178-51.

AIR CONTROLS, INC.
Division of the Cleveland Heater Co.
2310 SUPERIOR AVENUE • CLEVELAND, OHIO

CUSTOM BUILT— QUANTITY PRICED

atlas BOILER JACKETS

YES, Atlas combines highest quality with lower costs by using basic styles and eliminating tooling costs. You can get boiler jackets custom built to your specifications from ATLAS at prices that will surprise you. ATLAS offers three flush type boiler jacket styles to meet manufacturers' demands. All are of heavy gauge steel, with baked enamel finish, ready for quick installation. You'll find them all the last word in appearance and value.

ECONOMY

Square type construction is featured in this model. In spite of its fine appearance Economy is competitive in price. Ideal for large scale housing projects where price is a major factor.

QUALITY

The richness of the round-cornered top is combined with the simplicity and economy of the square-cornered body. This style is competitive in price with all standard construction designs.

DELUXE

This fully round-cornered design is Deluxe in every way. The full radius on all corners lends massiveness and beauty to its expensive appearance. Use Deluxe for your select dealer trade at surprisingly low cost.

Atlas also manufactures cabinets for heating, cooling and air conditioning units, and furnace cabinets of any style. We will be glad to quote cost estimates on any type of boiler jacket or cabinet on receipt of your specifications and requirements.

Atlas **MANUFACTURING COMPANY**
EUSTIS AT ROBBINS ST. • ST. PAUL 4, MINN.

"we cut and trim sheet metal

'quick as a wink'
'neat as a pin'"

"Cutting irregular shapes from sheet metal, for roofing and hot air ducts used to be a slow, rough job", reports Mr. Nero. "But we licked it, over ten years ago when we bought our first Stanley Unishear. Today we own several Unishears; they're an indispensable part of our shop equipment."

Let powerful Stanley Unishears lick your sheet metal cutting problems, too. They cut five times faster than hand snips . . . without effort. They leave smooth, clean, undistorted edges—no filing or other trimming necessary. Sizes—portable or stationary models—for every requirement.

On the job from East to West . . . Made by men who make tools **BEST**

Ask your distributor to demonstrate, or write for complete catalog; Stanley Electric Tools 442 Myrtle Street, New Britain, Connecticut.

STANLEY

Hardware
Tools
Electric Tools
Steel Strapping
Steel

STANLEY *Electric Tools*

appointments . . .

Previously, Mr. Norton was assistant to the general sales manager of the division.

ROBERT M. JOHNSON as southern California sales manager for General Controls Co. Previously, he was with Payne Furnace Div., Affiliated Gas Equipment, Inc. Leonard Schnall has been appointed to head a new field sales and service office for the company in Syracuse. Formerly, he was with International Harvester Co. and Lever Brothers, on the sales staffs.

R. M. Johnson

Leonard Schnall

JOHN MCGOWAN as a member of the sales staff in the New York City office of Scaife Co.

THOMAS L. OSBERGER, Detroit, as sales representative in southern Michigan and northern Indiana for Ohio Valley Hardware and Roofing Co. He has been in that territory since 1943. Bernard L. Rushton, Pittsburgh, is now the

. . . this is the address . . .

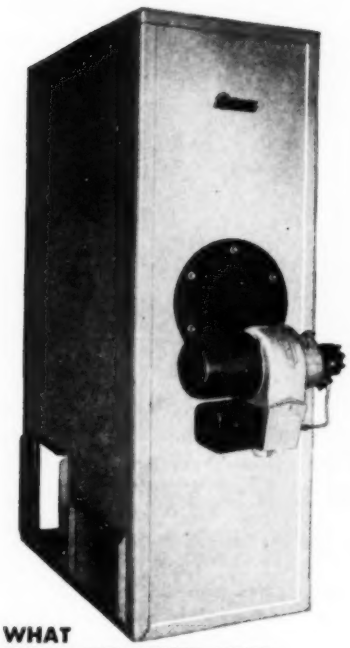
FOR PERFECT FITTINGS ON EVERY INSTALLATION . . NATURALLY, THEY'RE

Youngstown FITTINGS

All you have to do is send your order to us at the address below and your troubles with furnace fittings become things of the past. Youngstown Fittings are designed to go in right the FIRST time — no cutting or juggling to eat into your costs by slowing up your men. Get on the Youngstown bandwagon now . . . write us for literature.

YOUNGSTOWN FURNACE COMPANY
627 Marshall St. Youngstown, Ohio

THIS IS "JUNIOR"



WHAT SHALL WE NAME HIM?

What shall we name this warm air furnace with built-in, year 'round Domestic Hot Water Supply?

Metropac $500 CONTEST

to find a new name for "Junior" closes May 30. Winners will be announced in July issue of this magazine.

If your entry has not been sent in, mail it before May 31. Use your firm's letterhead. Send as many names as you like, but only one on each sheet, please.

Watch for Winners in July

METROMATIC MANUFACTURING COMPANY, EVERETT 49, MASSACHUSETTS

***NOW* even the Smallest Shop can**

SLASH SHEARING COSTS

with the fast new precision-engineered

WILDER JUNIOR METAL SLITTER

- **No gadgets to fool with**
- **No other expensive equipment tied up ● Trouble free**
- **Speed 73.3 fpm. Wt. 118 lb. Tolerance .005"**

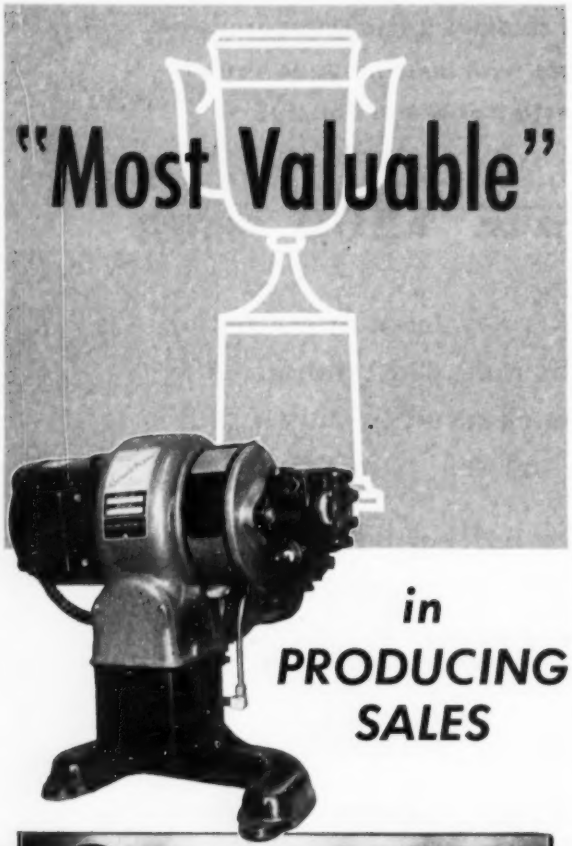
Features 2 power driven, hollow-ground edge, high carbon, high chrome tool steel blades
Oil impregnated porous bronze bearings

Specifications

Speed of cut—73.3 feet per minute
Gage capacity—20 gage mild steel and lighter
Horsepower—1/3 — 110 V — Single phase — 60 cycle
Shearing Width—1¼" to 24¼" to any length
Length—front to back—38"
Width—head frame—8¾"
Height—overall 43"
Weight—net—118 lb.
Width—less gage overall—28"
Width—gage length—40"
Height—to shear line—36"
Weight—crated—138 lb.

For complete information ask your jobber or write Sales Office, P.O. Box 1925, Carmel, California

WILDER MANUFACTURING CO. INC.



Sundstrand
All Electric
OIL BURNER

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

Because: Ultimate heating satisfaction means having an oil burner with

★ *DURABILITY*
★ *DEPENDABILITY*
★ *COMPACT DESIGN*
★ *OVERALL ECONOMY*
★ *QUIET OPERATION*

These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,

write to —

SUNDSTRAND ENGINEERING CO.
ROCKFORD, ILLINOIS

appointments . . .

representative in Pennsylvania, West Virginia and Maryland. For the past eight years, he has been associated with John H. Follansbee Co.

T. L. Osberger

Dean Wagoner, Jr.

DEAN WAGONER, JR., as sales representative for Roberts-Gordon Appliance Corp., to cover North and South Carolina. His headquarters are at 107 Walker Ave., Greensboro, N.C.

B. B. MAGEE, as western sales manager, Iron Fireman Mfg. Co. He has been transferred to the Minneapolis offices; for the past two years he has been serving the

WEBCO *the portable*

SHEET METAL BENDING BRAKE

The WEBCO brake offers the Slip End, Sliding Folding Fingers, and many other important features. The WEBCO will make bends up to 52°. Write for detailed information to:

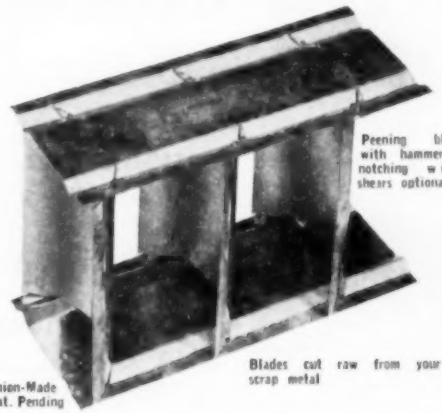
HALLMOR INC.
McMURRAY ROAD
BRIDGEVILLE, PA.

• ANGLE RINGS to Your Required SIZE •

We Roll Angle Rings to your specifications accurately with uniform curvature—that join up naturally—also Tees, Channels, Bars and special shapes—with or without rivet or bolt holes.
Saves time and effort when you back them up or fit them in on the job. Made to fit your needs—complete circles or any part thereof.
Used for reinforcing tanks, joining pipe or smoke stacks, installing air conditioning fans, and thousands of other uses. *Write for standard sizes and discounts.*

National Metal Fabricators
2140 S. Sawyer Ave. - Chicago 23, Ill.

It's SIMPLE — QUICK — PRACTICAL
the ALL-TITE VANE RUNNER


Peening blades with hammer or notching with shears optional
Union-Made Pat. Pending
Blades cut raw from your scrap metal

FOR INSTALLING TURNING VANES IN SQUARE ELBOWS

NO PUNCHING
NO NOTCHING
NO RIVETING
NO SPOT-WELDING
NO LAYOUT

WRITE TODAY FOR NEW DESCRIPTIVE FOLDER

ALL-TITE SHEET METAL CO., INC.
41-34 39th St. Box A Long Island City, N.Y.

Hammel MA
SALES ARE *ZOOMING!*

8 SIZES— 15,000 to 60,000 BTU—Most complete line available—Get the facts and you will handle *CIRCULAIRE* too.

WRITE OR CALL

Hammel
RADIATOR ENGINEERING CO.
Owned and Operated by A. L. Martinson and Associates
2348 Meter Ave. Los Angeles 24

Save TIME on every job

use "Made-Rite" fittings

One sure way to KEEP down job time is to check on the time spent in assembling warm and cold air runs. If it's excessive according to accepted standards then you'll do well to change your source of fittings.

That's the time to check with us . . . Made-Rite is a superior line of furnace fittings that will enable your men to work at top speed with no time lost in cutting or juggling. If you'll write, we'll prove it to you!

We solicit inquiries on slitting and recoiling, or shearing to lengths, of metal up to 36" wide — 14 gauge or lighter.

"Made-Rite" Co., Inc.

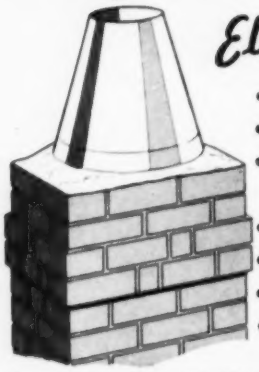
Manufacturers & Suppliers
Furnaces — Pipe & Fittings

10th and Monroe St. Newport, Ky.

Every Chimney Needs a

Wigwam Thermcap

Eliminates



- **DOWN DRAFT**
- **SLUGGISH DRAFT**
- **DAMAGING ACIDS**
- **CARBON**
- **CREOSOTE**
- **RAIN MOISTURE**
- **FLUE GAS CONDENSATION**

The WIGWAM THERMCAP improves combustion — thus saves fuel. Looks good — *is* good. Keeps entire chimney *dry*. Has no moving parts to wear out. Saves costly repairs. Poor draft is dangerous; good draft means economy. The patented principle of WIGWAM THERMCAP creates a draft-pull at the chimney top. ADAPTABLE TO ALL CHIMNEYS.

WRITE FOR COMPLETE INFORMATION

BOSTON MACHINE WORKS COMPANY

Oil Heating Supplies Division, Manufacturers, Lynn, Mass.

Every COOK Fan Blade is *Individually* precision set

- All blades balanced and set to proper pitch for rated horsepower and CFM.
- Aluminum hub and blade, cast separately, machined and fitted with precision accuracy.
- Blade is securely locked to hub for long life and true pitch by taper pin bolt.

The cut-away photo above shows why rugged Cook Fans last longer and actually deliver their stated capacity. Each blade is individually set to the proper pitch for the rated horsepower and CFM. Thousands of Cook-built propellors have already proved their dependability.

Sell Cook Industrial Fans and the New Cook "Chimney Style"* Attic Fan

Up-Blast Roof Ventilator in 16" to 48" sizes. Automatic dampers. Acid resistant coated, aluminum blades, up to 40,000 cfm output.

*Patent pending.

New "Chimney Style" Attic Fan saves attic space. Acid resistant coated steel chimney housing a direct drive fan. Easy to install, automatic dampers. Three sizes.

Cook Duct Fans. Direct or belt drive. Orifice 16" to 48". Ideal for spray booths.

Cook Type S Fans. Frame 24" to 48". Easy to install. Glass-insulated or explosion proof.

Portable Man-Cooler. Adjustable welded steel frame on rollers. Propeller 16" to 48".

COOK

Write for new catalog to Dept. AA, Loren Cook Co., Berea, Ohio

appointments . . .

company in Cleveland. Three new district sales managers have been assigned to the Northwest region: Arthur Kuhn, Dubuque; Fletcher Poole, Sioux Falls, S.D.; and Robert S. Bean, Minneapolis.

J. ALAN MACDONNELL as general sales manager, Gilbert & Barker Mfg. Co., filling the post formerly held by Irving C. Jacobs, who was recently elected to the presidency of the firm. Lawrence Marchese has been named assistant general sales manager, the position formerly held by Mr. MacDonnell.

J. A. MacDonnell

Lawrence Marchese

ROBERT K. GUY as head of a new department, comprising the service departments of the appliance, furnace and repair parts divisions, for Perfection Stove Co. His

CHICAGO *Steel* **PRESS BRAKES**

Many Standard Sizes
Latest Designs
and Features
for Fast Accurate Work.

Complete line of induction hardened forming dies for all makes of press brakes.

All sizes of CHICAGO press brakes are readily adapted for a wide variety of bending, forming, drawing, notching, blanking, punching, embossing, etc.

Full Particulars and Recommendations for Any Job upon Request

DREIS & KRUMP MANUFACTURING COMPANY

7404 S. Loomis Blvd., Chicago 36, Illinois

CHICAGO

From Any Angle . .

it pays to sell and install

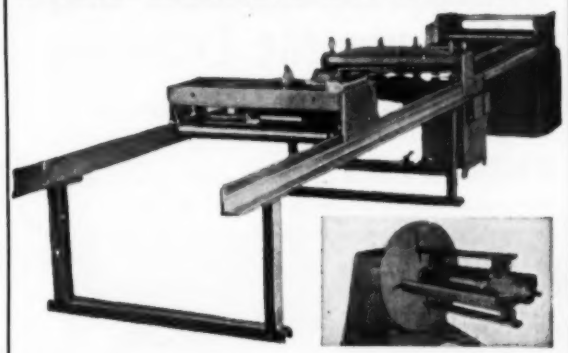
GALVAN ELBOWS

they fit perfect because they're perfect

Jobbers Everywhere Stock Them

GALVAN *Manufacturing Co.*
New Albany Indiana

Modern De-Coiling Equipment by "DAHLSTROM"



Coiled materials are fed, straightened, measured, cut into sheets, and ejected on a continuous basis automatically. Line shown handles to 36" widths in 20 ga. mild steel—coil weights to 6000#. OTHER CAPACITIES AVAILABLE.

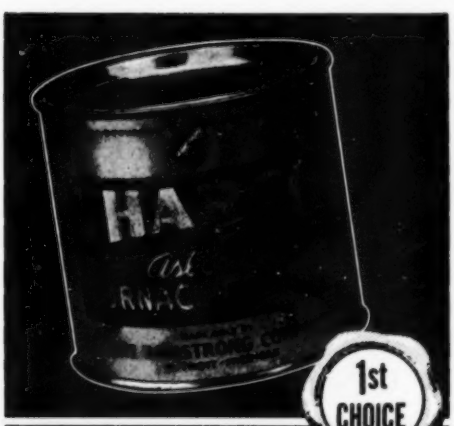
Inset shows self centering coil reel which is part of the complete line—Unit has infinitely variable speed drive between 35 and 100 fpm.

PURCHASE ALL YOUR MATERIALS IN COILED FORM AND ENJOY THE FOLLOWING ADVANTAGES:

- Lower material inventories
- Less Scrap (sheets can be cut to exact lengths needed)
- Material handling savings
- Tons more storage in the same space

DAHLSTROM MACHINE WORKS, INC.

4227 West Belmont Ave. Chicago 41, Ill.

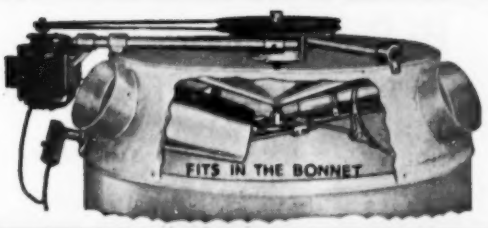


Standard in the field for nearly 40 years. THARCO stays put! — No shrinking, cracking or checking. Now available in either black or light gray in 1-pound cans to 350-pound drums. Order from your jobber.

The ARMSTRONG COMPANY

241 S. Post Street Detroit 17, Michigan

Convert Gravity Furnaces With A CIRCULATAIRE Bonnet Blower



CIRCULATAIRE ELIMINATES COLD ROOMS, BALANCES HEAT DISTRIBUTION, SAVES FUEL

CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

NOW READY — *New CIRCULATAIRE Sales Aids add effectiveness to selling interview, conserves valuable selling time and increases sales.*

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.

GET THE FACTS TODAY! WRITE...

CIRCULATAIRE DIVISION OF CORLETT-TURNER CO.
1001 S. KOSTNER AVE., CHICAGO 24

HomEase is the Burner that offers you the Exclusive

FLAME-IZER . . . *high CO_2 flame-fitting to the individual fire-box, quickly, easily!*

FIRE-STAT . . . *more starting air—thus less sooting and smoking on cold starts!*

MORE SALES.. GREATER PROFITS *easily!*

VARIOUS MODELS: .5 to 15 gph

HomEase has an important place in thousands of homes . . . has thousands of satisfied owners . . . it should have an equally important place with *you*. Get the all-important facts, *Now*

HomEase Products Company

PATERSON 3, NEW JERSEY

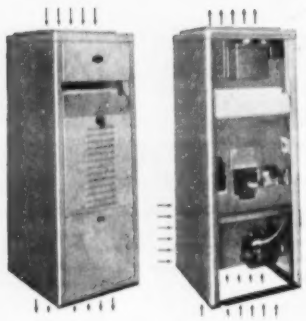
HOMEASE

THOMAS REGISTER

BARD G-70 Series

Gives You Choice of

Hi-Boy or Counterflow



Gas Winter Conditioner

•

70,000 BTU Input

•

Mono-Jet Burner

•

Multi-Radiator Construction

Very compact. Side inlet for HI-BOY Model G-70; or top inlet for COUNTERFLOW Model G-70-CS. AGA approved. High efficiency. PRICED LOW!

Call, Write, Wire.

BARD MFG. CO.

BRYAN, OHIO

appointments . . .

title is general service manager. Mr. Guy has been with the company since 1950.

R. K. Guy

W. R. Stiles

WALTER R. STILES as chief engineer in charge of product design for The Rybolt Heater Co. He has been chief engineer for Hall-Neal Furnace Co.

R. C. STARKE CO., Denver, as representative in Colorado and Utah handling the evaporative coolers of Trade-Wind Motorfans, Inc.

MAPES AND SPROWL, INC., 300 Burnet Ave., Union, N.J., as distributor for Reynolds Metals Co., to handle aluminum products. Hardware & Metal Supply Co., 967-973

W. A. WHITNEY LEVER PUNCHES
FOR EVERY SHOP AND TOOL BOX

No. 48 Punch

Capacity — 1/4" hole through 16 gauge metal
Length — 8 1/2" Depth of throat — 2"
Weight — 3 lbs. Stock size punches 1/16 to 9/32" by 64ths.

Write for catalog — then contact your jobber.

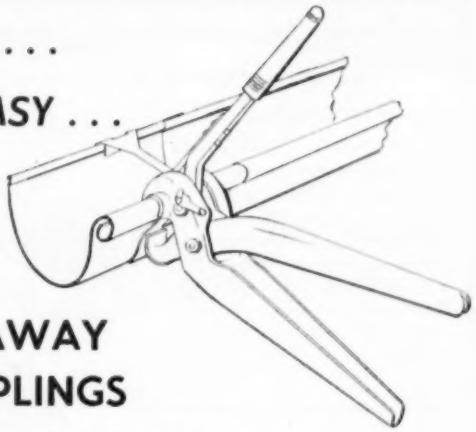
W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

SPLICE GUTTERS WATER TIGHT

FAST . . .

EASY . . .

With



MELAWAY COUPLINGS

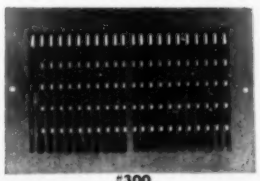
Adjustable for 4-5-6" half round gutter.

Will align gutter and square miters. Gutters may be joined at the eve as easily as on the ground.

Prevents expansion damage to gutter. The only satisfactory method for repairing gutter. Applicator guaranteed.

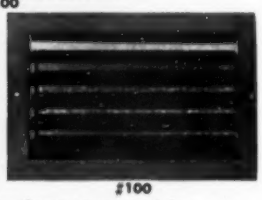
Write **MELAWAY CORPORATION**
BRANDON, WIS. PHONE 1361

See Your Jobber



#300

#200



#100

Many thousands of the above types used in housing projects. Lowest in price, more free area.

The Air-O-Vane ceiling diffuser. Also made in type D-R with positive shut-off control (Patents Pending) made in all sizes.

Greatest in free area of any ceiling diffuser and lowest in cost. Write for catalogue or see your jobber.

AIR-O-VANE CEILING DIFFUSER
WRITE FOR CATALOGUE TO —

KRUEGER
AIR CONDITIONING COMPANY

19 EAST RILLITO ST. TUCSON, ARIZONA

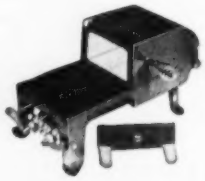
JUST AN OLD HEATING CONTRACTOR who made a mistake. He let the guy down the street get the Royal Heater line. Maybe there's a Royal-Jet dealership open in your area. *Why don't you give us a call today? Call collect. Cumberland 3-2117. Royal Heaters, Inc., Alhambra, Calif.*

MORE HEAT FOR YOUR DOLLAR
WITH JOHNSON BENCH SOLDERING FURNACES

1800°F. without forced air blast.

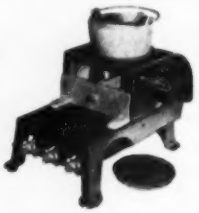
No. 101 Bench Furnace

The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox 3¾ x 4½ x 5½. Complete with work rest block and baffle plate. $18.80 F.O.B. factory.



No. 118 Combination Bench Furnace

For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Three burners. Firebox 6¼ x 5 x 6½. Complete with pot. $35.00 F.O.B. factory.

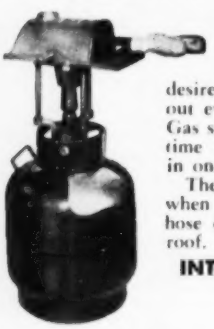


WRITE FOR FREE LITERATURE

JOHNSON GAS APPLIANCE CO.
580 E AVENUE N.W. CEDAR RAPIDS, IOWA

INSTANT LIGHTING **Insto-Gas**
T. M. REG. U. S. PAT. OFF.

SOLDERING IRON HEATER



Sheet metal contractors can now have hot soldering irons in 2 minutes and with Insto-Gas they can be kept at the desired temperature all day long without even looking at the heater. Insto-Gas saves 40% on fuel cost and enough time to pay for the entire equipment in one week's operation.

The Insto-Gas soldering iron heater when attached to the cylinder by 50-ft hose can be operated on a scaffold or roof.

INTERNALLY FIRED SOLDERING IRONS

These Insto-Gas soldering irons are designed for continuous operation with no stopping to change irons. Made in two sizes; the No 1-S (2) for fine work and the No 2-S (5) for heavy soldering.

Listed by Underwriters Laboratories and Factory Mutuals Laboratories

Write For Free Folder

INSTO-GAS CORPORATION
DETROIT 7, MICHIGAN

appointments . . .

N. Ninth St., Philadelphia, will distribute architectural aluminum mill products for the company.

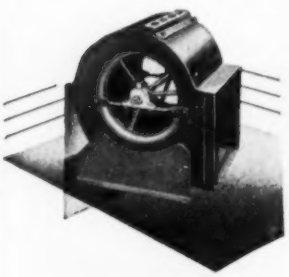
L. C. KROES as assistant sales manager, Brundage Co. Harold Austin is now sales and application engineer.

L. C. Kroes

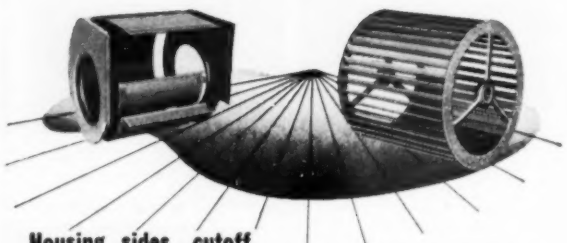
Harold Austin

L. RICHARD EDGCOMB as manager of non-ferrous sales for Edgcomb Steel Corp. Until recently, he was connected with the Los Angeles sales office of Reynolds Metals Co.

HARRY M. BOYSCHOU as manager of the Aurora Div., Republic Metals & Roofing Materials, Inc., Aurora, Ill. E. F. Mahlberg has been appointed manager and E. B.



MASSACHUSETTS
AIR CONDITIONING
FURNACE BLOWERS
Designed for manufacturers of warm air furnaces and air conditioning equipment.
Wheel Sizes 7½" to 27"



Housing sides, cutoff plate and scroll sheet. Heavy gauge steel stampings.

End spider suspension type wheel assembly.

Write for catalog

Manufacturers of centrifugal blowers for 36 years

MASSACHUSETTS BLOWER DIVISION
The BISHOP & BABCOCK Mfg. Co.
4901 HAMILTON AVENUE — CLEVELAND 14, OHIO

WHAT to EXPECT in a QUALITY Oil Burner?

- One-piece CAST IRON machined casting!
- BUILT-IN QUIETNESS!
- Designed with proper scroll development!
- FOR TOP EFFICIENCY 10 to 11% CO_2
- NO AIR SLIPPAGE in blower wheel
- HIGH AIR TURBULATION
- GOOD AIR PATTERN cast iron end cone
- EASY TO SERVICE note larger back plates

QUIET AUTOMATIC OIL BURNER

Imitated But Never Equaled!

7 SIZES—¾ to 30 gallons per hour. Flanged burner to fit any boiler or furnace.

AMERICA'S FINEST OIL BURNER

A PRODUCT OF

QUIET AUTOMATIC BURNER CORP.

J. G. KAVENY, President

33-35 BLOOMFIELD AVE. NEWARK 4, N. J.

For removing a LARGE VOLUME of Fumes or Air at HIGH VELOCITY

allen

VERTICAL DISCHARGE FAN

Whenever you face the problem of discharging fumes or vapors through a roof ventilator so that they will not short circuit back through building openings, you'll find the solution in this new Vertical Discharge Fan. It is designed especially for industrial applications that require the removal of a large volume at high velocity. The "VD" roof fan is fabricated of zinc-coated iron sheet with welded construction throughout. Automatic wing dampers open with air blast, close weathertight when not operating. The "VD" is available as direct drive with motor mounted inside air stream or as "VDR" with motor mounted outside throat of ventilator. Either type is available in a wide range of capacities and sizes.

Write for catalog on complete line of roof ventilators.

ALLEN ENGINEERED VENTILATION

PRODUCTION PLANNING CO.

ROCHESTER, MICHIGAN

Roof Ventilators for Every Commercial and Industrial Need

BUILT For BETTER CLEANING

the GRAND RAPIDS deluxe FURNACE CLEANER

Model of the Doyle Vac-It

Built by men who understand the problems of furnace cleaning, the Grand Rapids Furnace Cleaner has been developed into a highly serviceable unit meeting all the requirements for faster, easier and more profitable cleaning:

DURABLE—COMPACT CONSTRUCTION • LIGHTWEIGHT ALUMINUM HEAD ASSEMBLY • HIGH POWERED MOTOR • 9" DIAMETER ROTARY FAN • LARGE CAPACITY HEAVY DUTY STEEL TANK • FLEXIBLE RUBBER CLEANING HOSE WITH 2" INSIDE DIAMETER • EFFICIENT OUTSIDE FILTER BAG • FREE ROLLING SWIVEL-TYPE CASTER WHEELS • ENGINEERED FURNACE CLEANING ATTACHMENTS.

Write today for complete information

Doyle VACUUM CLEANER CO.

227 STEVENS ST., S.W. GRAND RAPIDS 7, MICH.

TORCH-O- Says:

"I'm trigger controlled for faster, easier soldering—brazing—melting"

Torch-o-matic saves time—saves gas! Just pull the trigger and air-acetylene gas automatically ignites—release trigger and gas shuts off instantly. No hazard from open flame when not in use. One-hand operation with no "time-out" to light up and adjust. Pays for itself many times over in savings and convenience. Three sizes of tubes and nozzles take care of any job. Fits your present equipment. Write for complete details.

VELOCITY POWER TOOL COMPANY

201 N. Braddock Ave. • Pittsburgh 8, Pa.

The Magic Regulator

WA-TROL

CUTS INSTALLATION COSTS

It's no problem to balance air distribution in half the time at half the cost when you use Wa-Trol, the Modern Regulator. Indicator shows at a glance exact position of damper. A simple twist of the knob gives accurate setting without any tools. Positive locking in any position. Wa-Trol is ideal for heating and air conditioning.

Wa-Trol, Proven in Over 5,000 Installations in First Six Months.

Send Today for Free Sample!

Pat. Pending

WA-TROL

Wa-Trol

Dept. A P. O. Box 6366 Houston, Texas

appointments . . .

Jantz, assistant manager of the new Hammond Div., 105 Industrial Rd., Hammond, Ind. A. G. Klein was named assistant sales manager of the Chicago office.

General Insulating Co., 2119 NW 22nd St., Miami, as distributor of fiber glass insulation materials in a 10 county Florida area for Libbey-Owens-Ford Glass Co.

William K. Drake as sales engineer in the Buffalo territory for Janitrol Div., Surface Combustion Corp. His office is located at 209 Morgan Bldg., Buffalo.

W. K. Drake

Lee N. Beardsley

Lee N. Beardsley as factory sales engineer for Delavan Mfg. Co. in Wisconsin, northern Illinois, Indiana, and

A NEW LINE . . .

FROM AN OLD COMPANY

Here's the NEW TRADE-WIND ZIP-AIR PORTABLE EVAPORATIVE COOLER THAT HAS EVERYTHING

Extra handy . . . extra efficient . . . extra safe for spot cooling—anywhere. That's the story on the sensational new Zip-Air Cooler by Trade-Wind. Merely fill the pan with water, plug in the unit to any outlet and the Zip-Air is ready to produce a refreshing volume of cool, filtered air.

FEATURES—Dual centrifugal blowers . . . three-way switch for air circulation or complete cooling . . . independent motor driven water pump . . . safety grille . . . flexible handle . . . weighs only 27 pounds.

Write for complete information.

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Manufacturers of a complete line of evaporative coolers and kitchen and small room ventilators.

Sell Humidification and Reap a Profit from MONMOUTH

Busy months are ahead — months when you will be servicing old and installing new warm air heating furnaces. You can make extra profits in these active months by talking controlled humidification to home owners — by selling them on increased comfort, better health, lower fuel costs.

Monmouth Humidifiers install quickly in any warm air furnace — capacities up to 420,000 B.T.U.

All employ Monite fast diffusion plates and time-tested non-corroding Flotrol or Microfeed controls.

They will meet every claim — build good will for you. Complete information sent on request. Write NOW.

CLEVELAND HUMIDIFIER CO.

7802 Wade Park Avenue Cleveland 3, Ohio

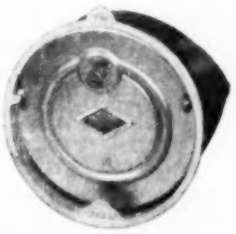
MONMOUTH HUMIDIFIERS

WALKER Automatic DRAFT REGULATORS

FUEL SAVERS

Impartial university tests show that Walker Regulators maintain constant draft values under all stack conditions. Copies of actual test charts are available on request.

Be sure to visit our Exhibit, Booth 113 at the National Plumbing & Heating Exposition May 6-9, Kansas City, Mo.



Specialization has made Walker Regulators the best in quality and the most economical to buy.

Rigid construction with highest grade materials and experienced craftsmanship insures Walker leadership in the Draft Regulator Field.

There is a type for every need. Our free Catalog shows a complete range of styles and sizes; contains valuable information on ordering and installation.

To assure your customers of complete satisfaction, ask for full information today.

WALKER MFG. & SALES CORP.
1709 PENN ST., ST. JOSEPH, MISSOURI

Another

LOWN SLIP ROLL FORMING MACHINE

New Model G-500

featuring Cone Rolling Attachment

Model G-550 Lown Slip Roll Former with 5" x 50" rolls, all power driven

A new improved modern design, engineered for durability, strength and service.

- **Initial Pinch Type — Alemite Lubrication**
- **Capacity Model B-550, 8 - 10 gauge 4' wide. (Available in shorter or longer lengths)**
- **Quick Acting Latch on Drop Arm.**
- **Handwheel Adjustment of Rear Roll.**
- **Roll Position Indicators.**
- **Gear and Shaft Housing of rigid Unit construction.**
- **Fast, sturdy, easy to operate. Prompt Deliveries.**
- **Other machines with 2" to 9" dia. rolls also available.**

Dealers in Principal Cities ***Write for Bulletins—Mention this Ad***

SAN ANGELO FOUNDRY & MACHINE COMPANY

BUILDERS OF BETTER *ROLLS*

1000 East Upton **San Angelo, Texas**

4 Real Reasons why 370 SPECIAL RED OXIDE PAINT

Can Cut Your Sheet Metal Painting Costs

1. **More coverage per gallon**
2. **Easy, fast application**
3. **One coat covers**
4. **Faster setting-up time**

Yes, 370 Special can save you money. Users report it covers more than five squares per gallon . . . sets up in 4 or 5 hours. It pleases your customers because it *really protects* against corrosion. Also available in green, blue, gray, brown and aluminum. ORDER 370 SPECIAL NOW FROM YOUR DISTRIBUTOR, or write for complete details and prices.

THOMPSON & COMPANY
1805 Allegheny Ave., Oakmont, Pa.
Established 1847

Cut Installation Costs! One hammer blow permanently rivets

E-Z-ON

E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

LEADING JOBBERS STOCK "EZ-ONS"
In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.
724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

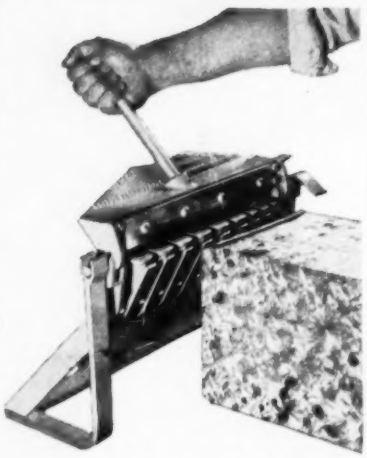
FLANGES THE DUCT

IN LESS THAN 5 SECONDS

Works like a bar-folder with a new twist.

Handling the work back and forth has been eliminated by a unique manipulation of the bender itself.

"Best little tool in the shop"



No money tied up in idle equipment . . . And no time wasted in making adjustments . . . Fits any size ducts up to width of bender and any thickness up to 20 gauge mild steel.

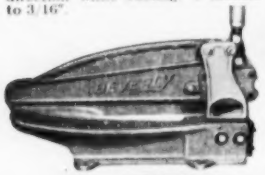
No. 12 SMITH'S CLEAT BENDERS (12" Wide) $42.00*
No. 18 SMITH'S CLEAT BENDERS (18" Wide) $66.00*
*Prices subject to change without notice)
FOB Waukegan, Illinois

R. E. SMITH
1806 BELVIDERE ST. WAUKEGAN, ILL.

Save Time...Labor...Material
with BEVERLY metal cutting SHEARS

throatless SHEARS

Make any cut—straight, irregular, curved. Exclusive design permits turning work any direction while cutting. 4 models—cap. to 3/16".



Inside SLOTTER

Makes cuts up to 8" inside edge of sheet. Sharp, clean burr-free cuts always assured. Cap. 16 ga. High strength aluminum alloy body; H C H C blades.

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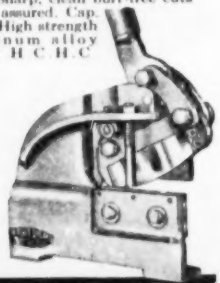
New "SS" Series—easier cutting with compounded linkage. 3 models—cap. to 1/8", trimming capacity to 1/4" mild.

See your Beverly Distributor. Write for FREE illustrated Bulletin.



Beverly SHEAR MFG. CO.
3020 W. 111th STREET • CHICAGO 43, ILLINOIS

appointments . . .

western Michigan. He has been a sales engineer for H. D. Conkey & Co.

R. E. HORTON as manager of all branch offices for Bryant Heater Div., Affiliated Gas Equipment, Inc. He has been managing the St. Louis branch office for the past five years. His headquarters will now be Cleveland. M. J. Fortier succeeds Mr. Horton at St. Louis. He has been a district representative for the company in the Chicago area.

R. E. Horton

M. J. Fortier

MARTIN G. RAAKE as manager of the new Chicago office of The Coleman Co., Inc. Located in the Merchandise Mart, the office will serve the company's distributors in

OUR ELBOWS HAVE PERFECT FORM

CONDUCTOR PIPE ELBOWS AND SHOES

- *All Sizes* • *All Angles*
- *All Metals* • *All Gauges*

SEE YOUR JOBBER

The CINCINNATI ELBOW CO.
2021 EASTERN AVE.
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JABSCO
Bronze Evaporative Cooler
PUMP

The outstanding pump for evaporative coolers. Here's why:

JABSCO'S ADVANTAGES:
- DRIVEN BY BLOWER SHAFT – separate pump motor and wiring eliminated
- INEXPENSIVE • EASY INSTALLATION
- NOISELESS • MAINTENANCE FREE

Capacity: 105 Gallons per Hour @ 500 RPM
180 Gallons per Hour @ 870 RPM
240 Gallons per Hour @ 1160 RPM

Write for free folder. Price includes pump, mounting brackets, hoses and screens. Liberal discounts to O.E.M. and distributor accounts.

price complete **$18.25**

EXCLUSIVE JABSCO FEATURES:
- NEOPRENE IMPELLER – Water lubricated – wiping action prevents liming
- ALL-BRONZE BODY
- STAINLESS STEEL SHAFT
- GRAPHITE BEARINGS
- MECHANICAL SHAFT SEAL

PATENTED AND PATENTS PENDING

JABSCO PUMP CO.
2941 N. Lincoln Street, Burbank, Calif.

MANUFACTURERS OF
FURNACE PIPE AND FITTINGS,
Prefabricated Ducts,
also conductor pipe, eaves trough, drip edge, rake strip, etc.

THOR METAL PRODUCTS CO., INC.
Box 118 Eastwood Station Syracuse, N. Y.

KIRK-BLUM

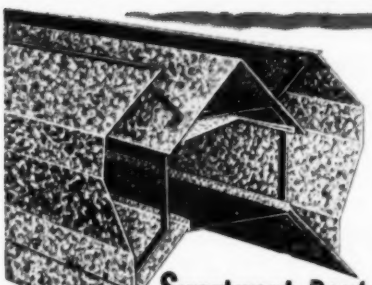
...One piece BLOW PIPE ELBOW SAVES YOU MONEY

- HOODS
- BALL JOINTS
- FLOOR SWEEPS • BLAST GATES
- STAMPED AND ROLLED ANGLE RINGS

Cheaper and stronger than the ordinary pieced elbow. KIRK & BLUM'S One-Piece Elbows are rolled into a tube, then crimped on an exclusive machine to form a super tight, rigid elbow. These and other blow pipe parts, made in production quantities, are superior, cost less than the ordinary kind. Made in light to heavy gauges, from 3-inch to 14-inch diameter. Write for literature and prices.

Ball Joints Any Size

THE KIRK & BLUM MANUFACTURING CO.
3180 FORRER ST. • CINCINNATI 9, OHIO



THE Original RIDGE VENT

The Quality Ventilator **for all important industrial installations**

Swartwout-Dexter Heat Valve
solves many roof ventilating problems
The Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio

ADAMS

Clean-Out Door

(Cast Iron)

Sizes: 5x7 ins.

to 30x24 ins.

Buy Adams Known Quality
THE ADAMS COMPANY
BRIDGE STREET • Established 1883 • DUBUQUE, IOWA

FOR PERFECT SOLDERING
and GREATER PROFITS

in less time use Rubyfluid, the fast acting easy-to-use soldering flux that wets out freely, properly conditions metal for a strong union. No objectionable or harmful fumes. See your jobber or write direct for special $1.00 offer.

RUBY CHEMICAL CO.
S. McDowell St. Columbus 8, Ohio

Rubyfluid

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Perforated
TO YOUR REQUIREMENTS

PERFORATED METALS
FOR ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG #35

DIAMOND MFG. CO.
BOX 34 WYOMING, PA.

Big Time and Money Savers for YOU!

LOCKFORMERS

- Cut Over-All Fabrication Costs in Half.
- Make Pittsburghs 15 Times as Fast as you Can Make them on a Hand Bending Brake.
- Pay for Themselves Quickly Out of the Extra Profits each one Earns.

ALL MODELS IN STOCK FOR IMMEDIATE DELIVERY!

Easy edgers and power flangers also available for immediate shipment.

- Send for illustrated folder and more information about this and other sheet metal working equipment.

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ALLEN SODER-FLUXES
FOR STRONGER JOINTS
For Soldering — Brazing — Welding

You can get a complete line of SODER-FLUXES from Allen for sodering, brazing and welding all metals.
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for BOILER, FURNACE & HEATER REPAIR PARTS

All kinds of heating, air conditioning equipment, and Insulating Materials.
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ORNAMENTS
STAMPINGS & SPINNINGS
Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.
If you don't have catalog K, send for it NOW.
MILLER & DOING
89 ADAMS STREET BROOKLYN, N. Y.

appointments . . .

eight Midwest states. Assigned to the Chicago zone are J. R. Montgomery, Mark Darmer and Tom Poletti, regional sales managers; Reginald Randall and Charles W. Barchers, service engineers, and J. R. MacDowell, water heater specialist. Mr. Raake joined the company in 1938, and prior to becoming zone manager, he was regional sales manager, with headquarters in Columbus.

H. RICHARD NIELSEN as sales manager, air conditioning division, Servel, Inc. He will be succeeded as southern regional sales manager by Nils D. Sellman. Mr. Nielsen has been with the company for six years; Mr. Sellman, for five.

S. OSBORNE as sales representative for Ashburn Supply Co. He will cover the territory north of the San Fernando Valley, Beverly Hills, West Los Angeles and Santa Monica.

SAMUEL G. WAGNER as assistant to the manager of the sheet and strip division, sales department, Inland Steel Co. He has been with the company since 1939. Richard D. Browne will succeed him as assistant manager of the order division. Mr. Browne has been head of the sheet and strip production scheduling section.

MILTON SHEET METAL
MACHINERY SPECIALISTS

STOCK DELIVERY ON PEXTO, CHICAGO BRAKES, DIACRO, ROUSSELLE PRESSES, KIDDER, WHITNEY, ROTEX PUNCHES, REX WELDERS

WE CARRY A COMPLETE STOCK OF NEW & USED HAND & POWER MACHINERY.

WE STOCK PUNCHES & DIES & ADAPTERS FOR ALL PRESSES & BRAKE DIES, SHEAR BLADES & SPOT WELDER-TIPS & HAND TOOLS.

MILTON EQUIPMENT COMPANY
N.E. COR. 4th & Race St. Phila. 6, Pa.
WAlnut 2-1734

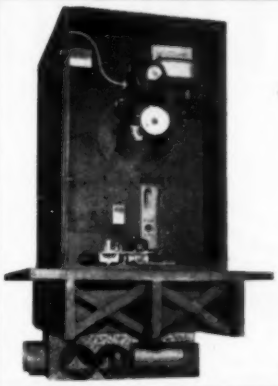
Special Notice!

AIR CONDITIONING SALES this year are expected to be greater than ever before. You will get a bigger share of this business by offering *air-borne bacteria control* through the nationally accepted *Glycolator* method.

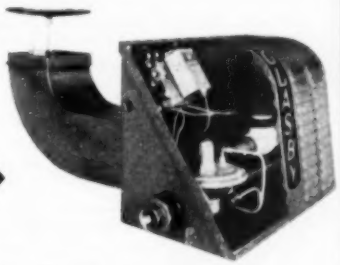
Get an early lead by adding this low cost, profit-producing appliance to your line NOW! Write for complete information:

Glycolator, Dept. A-1, Valencia, Pa.

GLASBY



UPSIDE-DOWN FURNACE
Model #65 gas unit for basementless homes, (front panel removed). Plenum below floor or in concrete slab. 95,000 Btu's.



GAS CONVERSION BURNER
Factory-assembled and tested. Push-button pilot lighter and safety switch. 2 models cover range 85,000 to 300,000 Btu's.

DEALERS, WRITE FOR INFORMATION ON OTHER FURNACES FOR SEMI-BASEMENT AND FULL BASEMENT HOMES

J. P. GLASBY MFG. CO., INC. 1 Montgomery St., Belleville, N.J.

Elgo Ventilating Specialties

"ELGO" TYPE AUTOMATIC SHUTTER Front View (Open)

NATIONALLY KNOWN AUTOMATIC SHUTTER

The Elgo is known from coast to coast as "tops" in automatic shutters because of its distinctive features, such as: Tight-fitting, weather-stripped louvers. Felt silencing pads — no wear or rattle. Unusual sensitiveness to air currents. Made in sizes from 12" to 72" square — also rectangular. Write for circular and prices.

Free CATALOG

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WINTER AIR CONDITIONING AND GRAVITY

CAST IRON — COAL FIRED

Popular Priced
Practical Design
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"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

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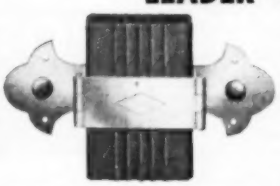
This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send $1.00 for a copy today to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue **Chicago 2, Ill.**

"FITRITE" HINGED BRONZE LEADER BAND

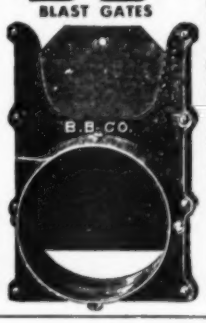


Made for 3" & 4" square corrugated. Also 3" & 4" round.

Ornamental, massive band (⅛" thick) for institutional building. Also made with church design.
Right side of band is permanently hinged. Left side has loose pin which permits removing leader for replacement without taking band from wall. Band can be adjusted to take care of variations in size of pipe.
Reasonably priced.
Write for descriptive literature.

DAVID LEVOW 308 West 20 ST. NEW YORK, 11
TELEPHONE CHELSEA 3-2400-2401

BB BLAST GATES



THESE BLAST GATES ARE DESIGNED FOR CLOSING OR PARTLY CLOSING PIPES SUPPLYING BLAST TO FURNACES, FORGES BOILERS, Etc.; FOR USE IN EXHAUST OF BLAST PIPE SYSTEMS WHERE AIR IS TO BE REMOVED OR DIRECTED FROM ONE CHANNEL TO ANOTHER.

THE OPERATION IS SIMPLE BUT POSITIVE. SIMPLY PULL THE SLIDE BACK AND FORTH AS DESIRED. SLIDE CAN BE LOCKED IN ANY POSITION BY THUMB SCREW.

THE BODY OF THIS GATE IS CAST IRON, LACQUERED TO PREVENT RUSTING; THE SLIDE HEAVY STEEL.

MADE IN SIZES TO FIT PIPE 2 INCH TO 24 INCH INCLUSIVE.

WRITE FOR DATA SHEET.

SOLD THROUGH LEADING JOBBERS EVERYWHERE

Manufactured by

BERGER BROS. COMPANY

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SERVICE SECTION

Rates for display space in the Service Section are $10.00 per inch per insertion. One-inch minimum space accepted.

"LITTLE GIANT"
Pipe Crimping Plier

IT'S NEW—BETTER—CHEAPER

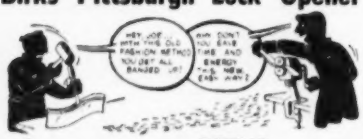
Has UNBREAKABLE PLASTIC HANDLE and LONG TAPERED ALLOY STEEL BLADE. IT OUTWEARS, OUT PERFORMS other SCRATCH AWLS.

Scratch Awl	90c each - $10.25 a dozen
Replaceable Blades for Awl	45c each
Unbreakable, Adj. Saw Handle	$1.95
Pioneer Heavy Duty Compass Blade	.85
Little Giant Pipe Crimper	$1.95
Cutter Clamps 4" 5" 6"	each size $1.95

Send Check or M. O. if your jobber can't supply Guaranteed Satisfaction or Money Refunded.

PIONEER TOOL CO.
1101 WISCONSIN AVE. RACINE, WIS.

Birks Pittsburgh Lock Opener



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Curved Or Straight Sections
- Easy To Operate
- Increases Production
- Prevents Injury
- $45.00 Complete F. O. B. Factory

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RUBBER LADDER SHOES
for safe climbing
$2.95 per pair
JOHNSON LADDER SHOE CO.
Eau Claire, Wisconsin

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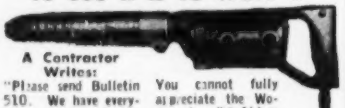

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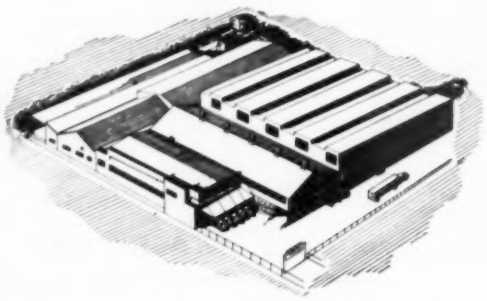

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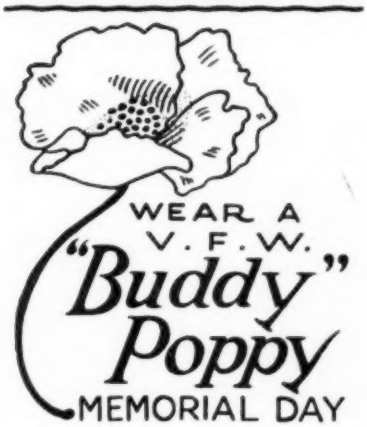

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1 Folding Die R&D for Elbow End 3/16	230.00
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2 Dimple Dies	100.00
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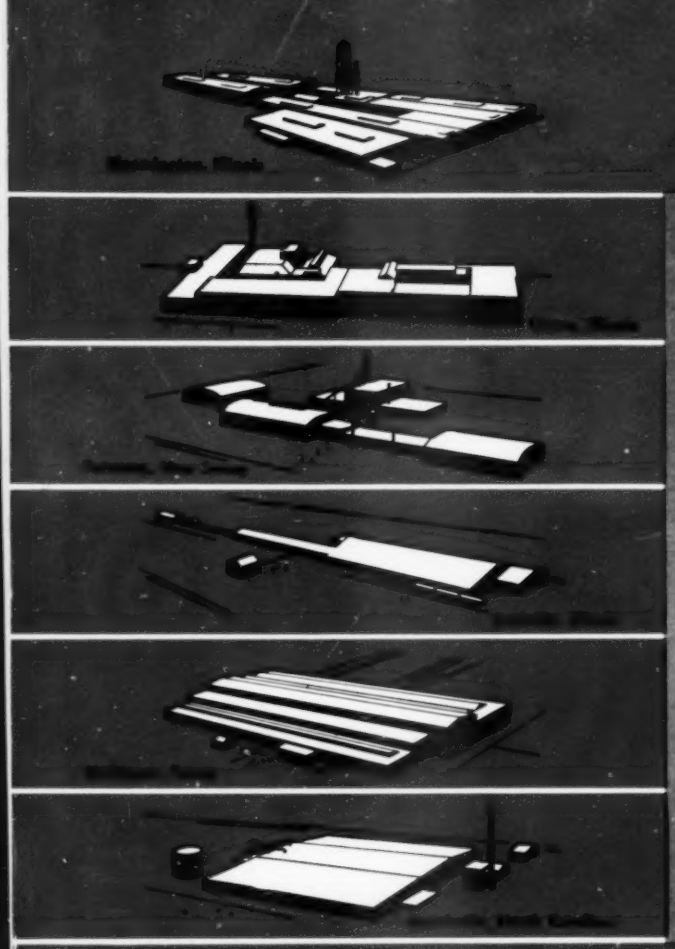

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